HAZARD RANKING SYSTEM (HRS) DOCUMENTATION RECORD COVER SHEET

Name of Site: Southeastern Wood Preserving

EPA ID No.: MSD000828558

Contact Persons

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Pathways, Components, or Threats Not Scored

The ground water migration, soil exposure, and air migration pathways were not scored in this Hazard Ranking System (HRS) documentation record because the surface water pathway is sufficient to qualify the site for the National Priorities List (NPL). These pathways are of concern to EPA and may be considered during future evaluation.

Ground Water Migration Pathway: Canton Municipal Utilities (CMU) operates six municipal drinking water wells within a 4-mile radius of the Southeastern Wood Preserving (SWP) property, serving about 15,000 customers (Ref. 28). The nearest CMU well is located within 0.25 mile of SWP (Ref. 27). CMU maintains two water treatment facilities where the water is mixed in distribution lines (Ref. 28). All six CMU wells are completed in the Sparta aquifer and range in depth from 892 feet below ground surface (bgs) to 1,075 feet bgs (Refs. 28; 29, p. 87; 30, p. 57). Hazardous substances were not detected in the CMU wells that were sampled during the September 2008 expanded site inspection (Ref. 5, Appendix B, Table 15, pp. B-32, B-33). There are 46 in use domestic wells that obtain water from the Cockfield aquifer (from 54 feet to 550 feet bgs) within a 4-mile radius of SWP (the nearest domestic well is located 0.5 to 1 mile from SWP) (Refs. 5, p. 13; 32, pp. 2 through 8). These wells are about 200 feet deep and serve approximately 131 people (Refs. 31, p. 1; 32). The surficial and Cockfield aquifers are separated by a Yazoo clay layer that is approximately 40 feet thick. The Cockfield and Sparta aquifers are separated by the Cook Mountain confining unit, which is encountered at a depth of about 450 feet bgs and is 60 to 200 feet thick in the vicinity of the SWP property (Ref. 5, pp. 13, 14). One temporary monitoring well installed in the surficial aquifer on the SWP property during the 2008 expanded site inspection contained concentrations of semivolatile organic compounds (Ref. 5, p. 15; 5, Appendix A, Figure 4, p. A-4; 5, Appendix B, Table 15, pp. B-32, B-33; 5, Appendix E, pp. E-72, E-73, E-74).

Soil Exposure Pathway: One surface soil (0 to 6 inches bgs) sample and one subsurface soil (12 to 24 inches bgs) sample were collected from each of six residential properties located southwest of SWP (Ref. 5, Appendix A, Figure 4, p. A-4; 5, Appendix B, Table 2, pp. B-3, B-4). Two of these properties are located within the original footprint of King Lumber, which operated a saw mill, lumber yard, and wood treating facility from 1928 to 1961 (Refs. 5, Appendix A, Figure 3, p. A-3; 7, p. i; 8, p. 1). Residential soil samples contained carcinogenic polycyclic aromatic hydrocarbons as well as dioxins and furans (Ref. 5, Appendix B, Tables 24, 25, and 26, pp. B-51 through B-62). About 3,951 people reside within 1 mile of SWP (Ref. 33, p. i). No residences are located on the SWP areas of observed contamination. Several federally designated endangered and threatened species inhabit Madison County, Mississippi; however, specific habitat locations have not been identified (Ref. 34, p. 5).

Air Migration Pathway: No air samples have been collected at SWP. The residential population within 4 radial miles of SWP is about 14,923 people (Ref. 33, p. i). Several federally designated endangered and threatened species inhabit Madison County, Mississippi; however, specific habitat locations have not been identified (Ref. 34, p. 5).

HAZARD RANKING SYSTEM (HRS) DOCUMENTATION RECORD

Name of Site:	Southeastern Wood Preserving
EPA Region:	4
Date Prepared:	September 2011
Street Address of Site*:	Northern side of Covington Drive (Ref. 5, Appendix A, Figure 2, p. A-2)
City, County, State, Zip:	Canton, Madison County, Mississippi, 39046
General Location in the State:	Central portion of state
Topographic Map:	Canton, MS (1989)
Latitude:	32° 37′ 5.019″ North
Longitude:	90° 1′ 5.4804″ West

The coordinates above for Southeastern Wood Preserving were measured from the center of the stockpile (Source No. 1) of partially treated waste material (Refs. 3; 5, Appendix A, Figure 2, p. A-2; 18, p. 4)

* The street address, coordinates, and contaminant locations presented in this HRS documentation record identify the general area where the site is located. They represent one or more locations the U.S. Environmental Protection Agency (EPA) considers part of the site based on the screening information EPA used to evaluate the site for National Priorities List (NPL) listing. EPA lists national priorities among the known "releases or threatened releases" of hazardous substances; thus, the focus is on the release, and not on precisely delineated boundaries. A site is defined as an area where a hazardous substance has been "deposited, stored, placed, or otherwise come to be located." Generally, HRS scoring and the subsequent listing of a release represent the initial determination that a certain area may need to be addressed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Accordingly, EPA contemplates that the preliminary description of facility boundaries at the time of scoring will be refined as more information is developed about where the contamination has come to be located.

Pathway	**Pathway Score**
Ground Water Migration	NS
Surface Water Migration	96.06
Soil Exposure	NS
Air Migration	NS
HRS SITE SCORE	**48.03**

Note:

NS Not scored

WORKSHEET FOR COMPUTING HRS SITE SCORE

	S Pathway	S^2 Pathway
Ground Water Migration Pathway Score (S_{gw})	NS	NS
Surface Water Migration Pathway Score (S_{sw})	96.06	9227.5236
Soil Exposure Pathway Score (S_s)	NS	NS
Air Migration Pathway Score (S_a)	NS	NS
$S^2_{gw} + S^2_{sw} + S^2_s + S^2_a$		9227.5236
$(S^2_{gw} + S^2_{sw} + S^2_s + S^2_a) / 4$		2306.8809
$\sqrt{(S^2_{gw} + S^2_{sw} + S^2_s + S^2_a) / 4}$		**48.03**

Note:

NS = Not scored

Table 4-1 –Surface Water Overland/Flood Migration Component Scoresheet			
Factor Categories and Factors	**Maximum Value**	**Value Assigned**	
Drinking Water Threat			
Likelihood of Release:			
1. Observed Release	550	550	550
2. Potential to Release by Overland Flow:			
2a. Containment	10		
2b. Runoff	25		
2c. Distance to Surface Water	25		
2d. Potential to Release by Overland Flow [lines 2a(2b + 2c)]	500		
3.Potential to Release by Flood:			
3a. Containment (Flood)	10		
3b. Flood Frequency	50		
3c. Potential to Release by Flood (lines 3a x 3b)	500		
4. Potential to Release (lines 2d + 3c, subject to a maximum of 500)	500		
5. Likelihood of Release (higher of lines 1 and 4)	550		550
Waste Characteristics:			
6. Toxicity/Persistence	(a)	NS	
7. Hazardous Waste Quantity	(a)	NS	
8. Waste Characteristics	100		NS
Targets:			
9. Nearest Intake	50		
10. Population:			
10a. Level I Concentrations	(b)	NS	
10b. Level II Concentrations	(b)	NS	
10c. Potential Contamination	(b)	NS	
10d. Population (lines 10a + 10b + 10c)	(b)	NS	
11. Resources	5	NS	
12. Targets (lines 9 + 10d + 11)	(b)		NS
Drinking Water Threat Score:			
13. Drinking Water Threat Score [(lines 5x8x12)/82,500, subject to a maximum of 100]	100		NS
Human Food Chain Threat			
Likelihood of Release:			
14. Likelihood of Release (same value as line 5)	550		550
Waste Characteristics:			
15. Toxicity/Persistence/Bioaccumulation	(a)	500,000,000	
16. Hazardous Waste Quantity	(a)	100	
17. Waste Characteristics	1,000		320
Targets:			
18. Food Chain Individual	50	45	

Table 4-1 –Surface Water Overland/Flood Migration Component Scoresheet (Continued)

Factor Categories and Factors	Maximum Value	Value Assigned	
19. Population			
19a. Level I Concentrations	(b)	0	
19b. Level II Concentrations	(b)	0.03	
19c. Potential Human Food Chain Contamination	(b)	0.0003	
19d. Population (lines 19a + 19b + 19c)	(b)	0.0303	
20. Targets (lines 18 + 19d)	(b)		45.0303
Human Food Chain Threat Score:			
21. Human Food Chain Threat Score [(lines 14x17x20)/82500, subject to maximum of 100]	100		96.06
Environmental Threat			
Likelihood of Release:			
22. Likelihood of Release (same value as line 5)	550		550
Waste Characteristics:			
23. Ecosystem Toxicity/Persistence/Bioaccumulation	(a)	NS	
24. Hazardous Waste Quantity	(a)	NS	
25. Waste Characteristics	1,000		NS
Targets:			
26. Sensitive Environments			
26a. Level I Concentrations	(b)	NS	
26b. Level II Concentrations	(b)	NS	
26c. Potential Contamination	(b)	NS	
26d. Sensitive Environments (lines 26a + 26b + 26c)	(b)	NS	
27. Targets (value from line 26d)	(b)		NS
Environmental Threat Score:			
28. Environmental Threat Score [(lines 22x25x27)/82,500 subject to a maximum of 60]	60		NS
Surface Water Overland/Flood Migration Component Score for a Watershed			
29. Watershed Score[c] (lines 13+21+28, subject to a maximum of 100)	100		96.06
Surface Water Overland/Flood Migration Component Score			
30. Component Score (S_{sw})[c] (highest score from line 29 for all watersheds evaluated; subject to a maximum of 100)	100		96.06

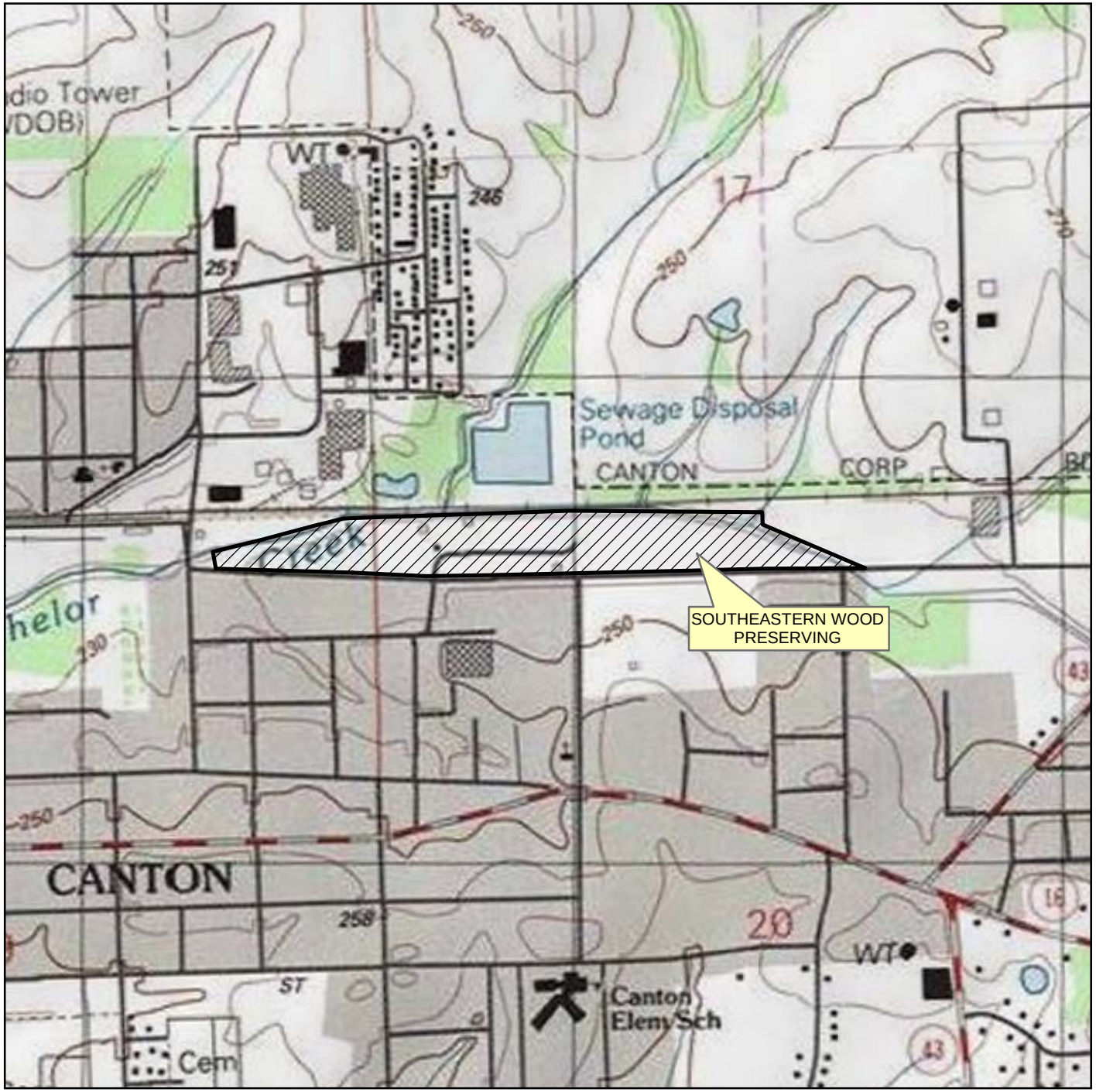
Notes:

[a] Maximum value applies to waste characteristics category

[b] Maximum value not applicable

[c] Do not round to nearest integer

NS Not scored



LEGEND

Approximate Property Boundary

0 500 1,000 Feet

1:12,000

Map Source:
USGS, Canton, MS 1989
Topographic Quadrangle.
Reference: 6, pp. 1, 2

United States Environmental Protection Agency

SOUTHEASTERN WOOD PRESERVING
CANTON,
MADISON COUNTY,
MISSISSIPPI
TDD No.TTEMI-05-003-0042

FIGURE 1
PROPERTY LOCATION

TETRA TECH

Path: C:\GIS_Workspace\TTEMI-05-003-0042_Southeastern_Wood_Preserving_ES\Figures\GIS\MXDs\Site Location Maps\SE-ESI WOOD SITE LOC MAP 7-21-11.mxd Date Saved: 7/21/2011 12:30:36 PM User: dale.vonbusch

LEGEND

- Approximate Extent of Batchelor Creek Removal
- Batchelor Creek Sediment Pile
- Approximate Extent of Slurry Wall
- Drainage
- Railroad
- Approximate Current Property Boundary
- Approximate Historical King Lumber Property Boundary
- Stockpile

Notes:
Aerial Photograph:
Google Earth, 2010
References: 6, pp. 1, 2; 7, pp. i, 3, 4, 5; 8, p. 3; 67, pp. 2, 3

0 350 700
Feet
1:8,400

N

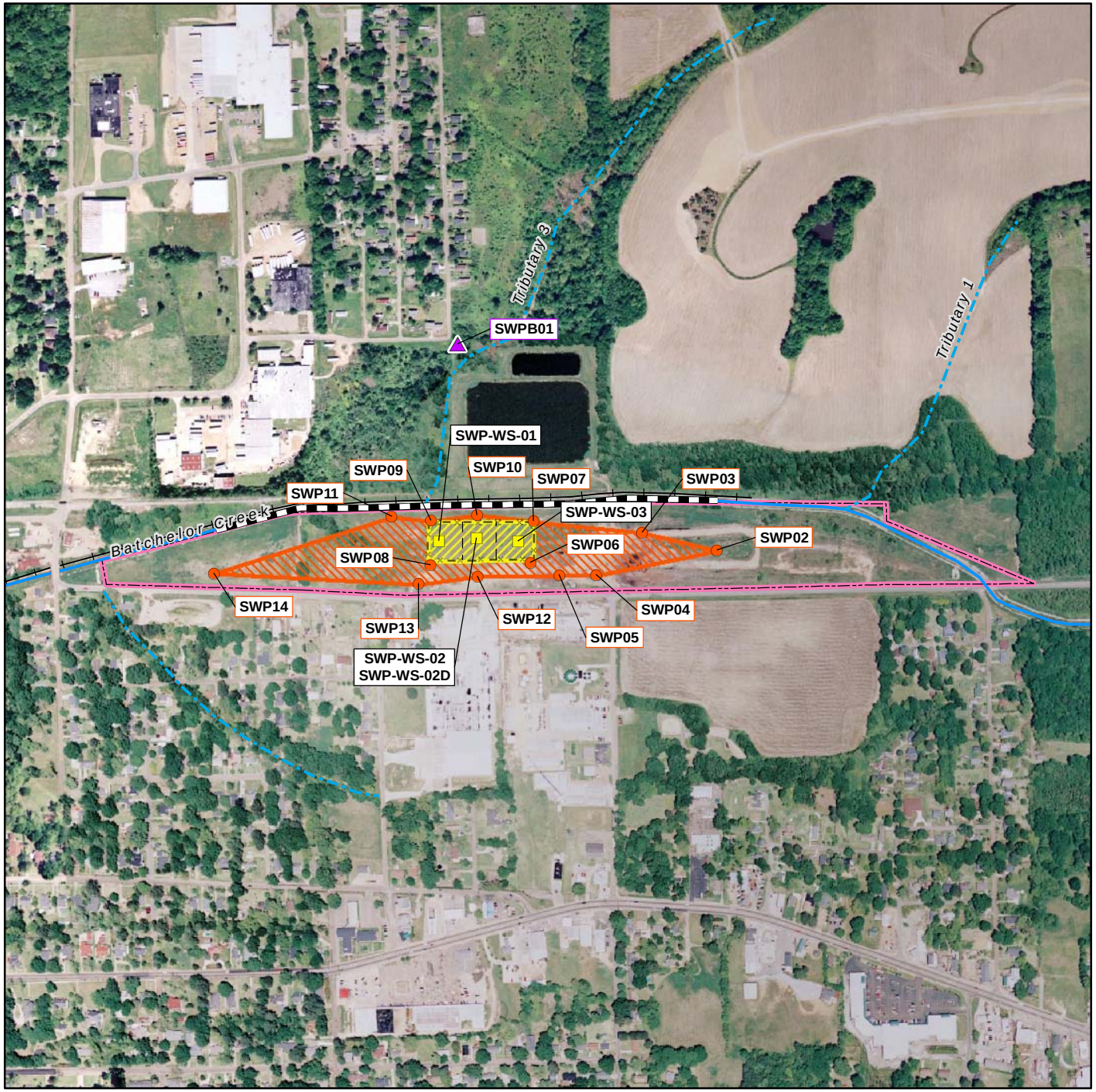
United States Environmental Protection Agency

SOUTHEASTERN WOOD PRESERVING
CANTON,
MADISON COUNTY,
MISSISSIPPI
TDD No.TTEMI-05-003-0042

FIGURE 2
CURRENT PROPERTY LAYOUT

TETRA TECH

2010-7-19 \GIS_Worksnace\TTEMI-05-003-0042_Southeastern_Wood_Preserving_ESI\Figures\GIS\MXDs\Property Layout Maps\SWP-ESI PROPERTY LAYOUT 8x11 7-16-10.mxd TTEMI-KY dale.vonbusch



LEGEND

- Source No. 1 Sample Location
- Source No. 2 Sample Location
- Background Sample Location
- PPE 1
- Drainage
- Railroad
- Approximate Current Property Boundary
- Source No. 1 (Stockpile of Partially Treated Waste Material)
- Estimated Extent of Source No. 2 (Contaminated Soil)

Notes:
Aerial Photograph:
DigitalGlobe/GlobeXplorer, 2007.
References: 5, Appendix A, Figure 4, p. A-4;
6, pp. 1, 2; 19, Appendix A, Figure 2, p. A-2

B - Background
D - Duplicate
SWP - Southeastern Wood Preserving
WS - Waste sample

0 350 700
Feet
1:8,400

N

United States Environmental Protection Agency

SOUTHEASTERN WOOD PRESERVING
CANTON,
MADISON COUNTY,
MISSISSIPPI
TDD No.TTEMI-05-003-0042

FIGURE 3
SOURCE LOCATIONS

TETRA TECH

2010-7-17 \GIS_Workspace\TTEMI-05-003-0042_Southeastern_Wood_Preserving_ESI\Figures\GIS\MXDs\Source Location Maps\SWP-ESI SOURCE LOC MAP 8x11 7-16-10.mxd TTEMI-KY dale.vonbusch

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77. Tetra Tech. Project Note to File. Subject: September 2008 EPA Expanded Site Inspection Sediment Sample Distances. July 14, 2011. 1 Page.

78. Tetra Tech. Electronic Mail Correspondence. Between Sandra Harrigan, Environmental Scientist, and Carter Williamson, Federal On-Scene Coordinator, Emergency Response and Removal Branch, EPA Region 4. Subject: Southeastern Wood Preserving Batchelor Creek Excavation. Attachment: Google Earth Map. August 19, 2011. 2 Pages.

SITE DESCRIPTION

The Southeastern Wood Preserving (SWP) facility is located along Covington Drive in Canton, Madison County, Mississippi (Ref. 5, Appendix A, Figure 2, p. A-2) (see Figure 1 of this HRS documentation record). More specifically, the geographic coordinates as measured from the center of the partially treated waste material stockpile are 32° 37′ 5.019″ north latitude and 90° 1′ 5.4804″ west longitude (Ref. 3). The U.S. Environmental Protection Agency (EPA) identification number, as recorded in the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database, is MSD000828558 (Ref. 24).

The SWP property covers about 25 acres of land and includes an abandoned scale house, a silo which housed wood chips used for boiler fuel, and a large stockpile of partially treated waste material (Refs. 5, Appendix A, Figure 2, p. A-2; 6, p. 2; 7, p. i; 18, p. 4). A wood chipping operation (Penick Organics) currently leases the SWP property from the owner, the Madison County Economic Development Authority (formerly the Madison County Industrial Development Authority), and operates on the eastern portion of the SWP property (Refs. 6, p. 2; 7, pp. i, 4, 5) (see Figure 2 of this HRS documentation record). This operation grinds scrap wood into mulch for landscaping and sells the mulch in bulk. A scale house and an office were built for this operation and the old silo is used for storage (Ref. 7, pp. i, 5).

Land uses surrounding the property are predominantly agricultural, residential, and light industrial (Refs. 5, p. 2, Appendix A, Figure 2, p. A-2; 6, pp. 2, 3) (see Figures 1 and 2 of this HRS documentation record). The SWP property is bounded to the north by Batchelor Creek and the Illinois Central Gulf Railroad, which is no longer in operation; to the east by a residential and industrial area; to the south by Covington Drive; and to the west by residential and agricultural properties (Ref. 5, p. 2, Appendix A, Figure 2, p. A-2).

For HRS scoring, the site consists of two sources and associated releases. Source No. 1 is a stockpile of partially treated waste material located in the central portion of the property (Refs. 14, p. 3; 16, pp. 1, 2; 18, p. 4). This area will be referred to as the stockpile throughout this HRS documentation record. Source No. 2 is contaminated soil located on the SWP property in areas surrounding Source No. 1 (Ref. 5, Appendix A, Figure 2, p. A-2; 5, Appendix B, Tables 8 through 14, pp. B-11 through B-31) (see Figure 3 of this HRS documentation record). Source Nos. 1 and 2 contain semivolatile organic compounds (SVOC) and dioxins and furans (see Section 2.2 of this HRS documentation record). These hazardous substances have also been documented in sediment samples collected from Batchelor Creek, which receives runoff from Source Nos. 1 and 2, indicating that a release has occurred to the surface water migration pathway (see Section 4.0 of this HRS documentation record).

OPERATIONAL AND REGULATORY HISTORY

The current SWP property was originally part of a larger property owned by King Lumber, which operated the facility as a saw mill, lumber yard, and wood treating operation beginning in 1928 (Refs. 7, p. i; 8, p. 1; 69). Canton Treating Company leased the wood treating operation portion of the King Lumber property (currently the SWP property) in 1961 and later purchased the property in 1964 (Ref. 8, p. 5). In 1965, Dickson Treating Company (Dickson) began operations on the SWP property. Dickson operated the facility until it filed for bankruptcy in late 1979. The assets were held by bankruptcy court from 1979 until 1982, when SWP purchased the property. In 1984, SWP defaulted on its small business administration loan without ever operating the facility (Ref. 9, p. 1). During the foreclosure auction in 1984, White Pole and Timber Company of Kennedy, Alabama, purchased the physical assets of the SWP operation and the Madison County Economic Development Authority (formerly the Madison County Industrial Development Authority) purchased the property and remains the current owner (Refs. 5, p. 3; 6, p. 2; 8, p. 2; 9, p. 1).

During former operations, southern yellow pine timbers were stripped of bark and placed in retort cylinders for drying. Wood preservatives, hot creosote or pentachlorophenol (PCP), were pumped into the cylinders. The cylinders were pressurized to force the liquid into the wood until it was saturated. The wood was then removed and allowed to drip dry in the central portion of the SWP property, and the

residual liquid was drained (Refs. 8, p. 2; 10, p. 2; 11, p. 1; 12, p. 1). Three unlined wastewater treatment surface impoundments were constructed on the SWP property for disposal of wood preserving treatment sludges and process wastewater (Refs. 9, p. 1; 10, pp. 1, 2; 13, p. 5; 14, p. 2). During the 1970s, the facility received several notices of violation and fines from the Mississippi Pollution Control Commission (currently the Mississippi Office of Pollution Control) for gross contamination of the process area; releases of hazardous substances to Batchelor Creek; and inadequate treatment of process wastewater before it was discharged into the city sewage treatment facility (Ref. 10, pp. 1, 2). Before 1977, when the Clean Water Act was enacted, the facility reportedly discharged approximately 50,000 gallons of wastewater per day directly into Batchelor Creek, which flows through a city park, a residential area, and downtown Canton before it enters Bear Creek (Refs. 11, p. 1; 15, p. 1). The State of Mississippi received complaints of children, who had been playing in the creek near the city park, suffering from creosote burns (Ref. 14, p. 4). When operations ceased in 1979, the property included large areas of contamination in the treatment and storage areas, as well as piles of contaminated soil, creosote sludge storage tanks, and three unlined wastewater surface impoundments that had been filled by a previous owner at an unspecified time (Ref. 9, p. 1).

PREVIOUS INVESTIGATIONS

In September 1985, the Mississippi Bureau of Pollution Control (MBPC) conducted a preliminary assessment (PA) of the SWP property (Ref. 12, p. 1). MBPC observed several piles of creosote-contaminated soil on the SWP property that had been left by the previous owner (Dickson) after operations ceased in 1979 (Refs. 9, p. 1; 12, p. 2). MBPC also spoke with a former Dickson employee who reported that, in 1977, wastes were loaded into tanker trucks and disposed of in the city dump. After an investigation of the city dump, it was discovered that the waste was discharged into a bed of sawdust near a creek bank. In addition, there was evidence that PCP was leaking from the sawdust pile into the creek (Ref. 12, p. 3). The name of the creek was not provided in the PA (Ref. 12, p. 3). Based on observations made during the PA and the history of the property, MBPC concluded that a site investigation of the SWP property was warranted (Ref. 12, p. 6).

In December 1985, MBPC conducted a site inspection at the SWP property, which included collection of one composite soil sample from the process area, one collocated surface water and sediment sample from Batchelor Creek upstream of the SWP property, and one collocated surface water and sediment sample from Batchelor Creek downstream of the SWP property (Ref. 13, pp. 1, 3, 8, 11, 13). The samples were analyzed for SVOCs (Ref. 13, pp. 11 through 19). The soil sample (SW-3) contained anthracene, benzo(a)anthracene, phenanthrene, and pyrene (Ref. 13, p. 19). No contaminants were detected in the upstream surface water sample (SW-1), and bis(2-ethylhexyl)phthalate was the only contaminant that was detected in the upstream sediment sample (SW-1, Sediment) (Ref. 13, pp. 10, 11, 15, 17). The downstream surface water sample (SW-2) contained PCP and pyrene among others (Ref. 13, p. 16). The downstream sediment sample (SW-2, Sediment) contained anthracene, naphthalene, phenanthrene, and pyrene (Ref. 13, p. 18).

In 1986, EPA initiated an emergency response action at the SWP property to stabilize three unlined surface impoundments that contained creosote sludge and water. Approximately 8,000 cubic yards, or 12,000 tons, of sludge were excavated from the impoundments and stabilized with approximately 70 cubic yards of lime (or concrete) kiln dust (Refs. 14, p. 2; 51, p. 1; 61, p. 3). Bottom sediment sludge from the impoundments contained total polycyclic aromatic hydrocarbons (PAH) at a concentration of 3,815 milligrams per kilogram (mg/kg) and was, therefore, classified as a Resource Conservation and Recovery Act (RCRA) K001-listed hazardous waste (Ref. 51, pp. i, 2). RCRA K001 hazardous waste is defined as bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote or PCP (Ref. 52, p. 63). The stabilized sludge was then stockpiled on the property to await treatment or disposal (Refs. 14, pp. 3, 5; 61, p. 3).

In 1988, the U.S. Department of Agriculture (USDA) Soil Conservation Service (SCS) (currently known as the Natural Resources Conservation Service) designed a soil erosion prevention plan that included excavating and widening Batchelor Creek. While surveying the creek, SCS personnel observed oily waste leaching into the creek from the SWP property. SCS requested EPA's assistance and, in response,

EPA excavated contaminated soil from the creek bank observed to be leaching contaminants into Batchelor Creek to facilitate the SCS stream widening project (Refs. 14, p. 3; 61, p. 3). EPA sampled the excavated soils. The soils contained PAHs at concentrations ranging from 199 mg/kg to 865 mg/kg (Refs. 9, p. 4; 14, p. 3; 61, p. 3). EPA also installed a geofabric liner in the bed of the creek, and the banks were lined with rip-rap to prevent erosion (Ref. 9, p. 4). The visibly contaminated soil that was excavated from the creek bank was added to the stockpile of bottom sediment sludge excavated from the impoundments. The remaining excavated soil was spread over the property (Ref. 61, p. 3).

From 1991 to 1994, OHM Remediation Services Corp., under contract with EPA, treated the stockpile using a slurry phase bioremediation system that was constructed on the SWP property (Refs. 16, pp. 1, 2; 51, p. i). This system consisted of a power screen, a slurry mix tank, four slurry phase bioremediation reactors (bioreactors), and a slurry dewatering unit. The bioreactors were operated on a batch basis, and each batch was monitored during treatment to evaluate performance with respect to cleanup goals (Ref. 51, pp. i, 5). Initially, the goal was to reach the K001 (wood preserving waste) treatment standard for each individual PAH. However, after several failed attempts to reach K001 land disposal restriction standards — specifically with respect to phenanthrene and pyrene — a treatability variance was requested and approved (Refs. 16, pp. 1, 2; 43, pp. 3, 4, 7; 51, p. 7). The treatability variance involved modifying the K001 cleanup standards to be based on total PAH concentrations instead of individual PAHs (Ref. 51, p. 7). As a result, the cleanup goals were modified to 950 mg/kg total PAHs dry weight soil solids and 180 mg/kg benzo(a)pyrene-equivalent carcinogenic PAHs dry weight soil solids. In addition, the modified cleanup goals allowed 15 percent of the treated soil to contain a total PAH concentration less than 1,100 mg/kg, and 25 percent of the treated soil to contain a benzo(a)pyrene-equivalent concentration less than 230 mg/kg (Refs. 16, p. 3; 51, pp. 7, 10). With the variance in place, EPA was able to meet the cleanup goals (Ref. 51, p. 11). A containment cell consisting of earthen berms lined with 40-mil high-density polyethylene was constructed to contain the partially treated waste. The treated soil and debris were placed within the containment cell, with a visqueen layer segregating the treated soils and debris. The containment cell was capped with a 12-inch-thick compacted layer of clay. The clay cap was then covered with 4 inches of topsoil and subsequently fertilized and seeded. The entire containment cell was enclosed with a chain link fence. Remediation was completed in 1995 (Refs. 16, p. 4; 53, pp. 219 through 223). The containment cell with the partially treated waste is evaluated as Source No. 1 in this HRS documentation record.

In March 1994, the Mississippi Department of Environmental Quality (MDEQ) prepared a site inspection prioritization (SIP) report using existing sampling data and file information (Ref. 10, p. 1). MDEQ confirmed that the contaminated soils, sediments, and surface water on and adjacent to the SWP property contained hazardous substances associated with the wood treating process (Ref. 10, p. 2). MDEQ also updated target data, which included identifying 41 private residential wells within a 4-mile radius of SWP and fishing in Batchelor Creek, Bear Creek, and the Big Black River (Ref. 10, pp. 3, 4).

From 1997 to 2002, site inspections were conducted at the SWP property and EPA communicated with Scott Penn Inc. regarding a Brownfields prospective purchaser agreement (PPA); however, available information does not indicate that the PPA was finalized (Ref. 17, pp. 1, 2). In October 2002, MDEQ related to EPA the results of an investigation of Batchelor Creek, when PAHs (creosote-component compounds) were detected. In response to MDEQ concerns, on February 26, 2003, EPA and MDEQ conducted a site reconnaissance at the SWP facility. Based on this visit, EPA concluded that the surface water pathway was of concern and agreed that contamination was present in Batchelor Creek (Ref. 17, p. 2).

In 2006, MDEQ discovered new historical information during research on the SWP property at the Mississippi Archives and History facility. An aerial photograph taken in 1965 revealed the approximate location of a PCP wood treating area on the eastern portion of the SWP property. MDEQ also found an old legal property description, which indicated a larger property "footprint." With the addition of this new information and the recent population growth in Canton, Mississippi, EPA agreed that further investigation of the SWP property was warranted (Ref. 17, p. 2).

In 2007, EPA Science and Ecosystem Support Division (SESD) personnel advanced soil borings along the northern boundary of the property, between the stockpile, former lagoons, and Batchelor Creek, to evaluate whether pathways for free-phase creosote to enter Batchelor Creek exist and, if so, where they enter the creek. Visible and odorous impacts (believed to be organic contamination) to the soil were observed in several of the borings adjacent to and west of the stockpile. In addition, free-phase creosote was observed in at least one boring at a depth of 6 to 10 feet bgs located adjacent to the stockpile (Ref. 18, pp. 4, 6, 12, 19).

On February 28, 2008, Tetra Tech, on behalf of EPA, conducted a removal site evaluation (RSE) to assess whether a removal action would be appropriate in accordance with Title 40 of the *Code of Federal Regulations* (CFR), Part 300, Section 300.415, as well as to estimate the volume of waste present on the property (Ref. 19, pp. 1, 2). Tetra Tech collected four five-point composite waste samples, including one duplicate sample, from the stockpile to identify disposal requirements. Two grab sediment samples were also collected from Batchelor Creek downstream of the stockpile to evaluate whether hazardous substances were migrating from the stockpile into the adjacent Batchelor Creek (Ref. 19, p. 2). The sediment and waste samples contained anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(k)fluoranthene, chrysene, naphthalene, phenanthrene, pyrene, and dioxins and furans.

In September 2008, Tetra Tech, on behalf of EPA, conducted an expanded site inspection (ESI) at the SWP property (Ref. 5, pp. 1, 7). Surface and subsurface soil and waste samples were collected throughout the SWP property (Ref. 5, p. 7). In addition, sediment samples were collected from Batchelor Creek and unnamed tributaries of Batchelor Creek (Ref. 5, p. 7). Surface and subsurface soil and waste samples contained anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, dibenzofuran, indeno(1,2,3-cd)pyrene, pentachlorophenol, phenanthrene, pyrene, and dioxins and furans (Ref. 5, p. 11, Appendix B, Tables 8 through 14, pp. B-11 through B-31). Sediment samples collected from Batchelor Creek contained anthracene, naphthalene, phenanthrene, and pyrene (Ref. 5, Appendix B, Tables 21 through 23, pp. B-44 through B-50).

Also in September 2008, the EPA advanced 29 borings between 0 and 36 feet bgs throughout the SWP property and within the stockpile. Two borings, PILE01 and PILE02, were collected from the center of the stockpile (Ref. 47, p. 1, Enclosure 1, p. E1-1, Enclosure 2, pp. E2-27, E2-28). According to borehole logs for these two samples, solidified lagoon sludge was encountered between 4 and 9 feet bgs (Ref. 47, Enclosure 1, p. E1-1, Enclosure 2, pp. E2-27, E2-28). Borings advanced between the stockpile and Batchelor Creek, as well as west of the stockpile along Batchelor Creek, contained free product (creosote) weeps. Free product was noted in 14 of the 29 boreholes (Ref. 47, p. 1, Enclosure 1, p. E1-1, Enclosure 2, pp. E2-1 through E2-29). Boring P3 located west of the stockpile contained free product weeps as deep as 33 to 36 feet bgs (Ref. 47, Enclosure 1, p. E1-1, Enclosure 2, p. E2-20).

From August 2009 to November 2010, EPA conducted a time-critical removal action at the SWP property under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (Ref. 75, p. 1). Because of the creosote contamination in Batchelor Creek, EPA excavated between 1,500 and 1,800 linear feet of Batchelor Creek adjacent to the SWP property at depths ranging from 5 to 15 feet below the creek bed and stockpiled the creosote-contaminated sediment (approximately 45,000 to 50,000 tons) on the western portion of the property (Refs. 44, p. 1; 62; 70; 78) (see Figure 2 of this HRS documentation record). Post-excavation sediment samples were collected during four sampling events from November 2009 to March 2010. Twelve sediment samples (including one duplicate) were collected from 11 locations along the excavated bottom of Batchelor Creek (Ref. 75, p. 3). SVOCs detected in these samples included anthracene (up to 5,600J µg/kg), benzo(a)anthracene (up to 5,100J µg/kg), benzo(a)pyrene (up to 1,300 µg/kg), benzo(k)fluoranthene (up to 1,400 µg/kg), chrysene (up to 5,100J µg/kg), dibenzo(a,h)anthracene (up to 170J µg/kg), dibenzofuran (up to 17,000 µg/kg), fluoranthene (up to 37,000 µg/kg), indeno(1,2,3-cd)pyrene (up to 470 µg/kg), naphthalene (up to 11,000 µg/kg), phenanthrene (up to 69,000 µg/kg), and pyrene (up to 19,000 µg/kg) (Ref. 75, Appendix B, p. B-1).

On March 11, 2010, EPA collected six sediment samples (including 1 duplicate) from the creosote-contaminated sediment stockpile. SVOCs detected in these samples included anthracene (up to 5,600 µg/kg), benzo(a)anthracene (up to 3,200J µg/kg), benzo(a)pyrene (up to 1,200 µg/kg),

benzo(k)fluoranthene (up to 1,200 µg/kg), chrysene (up to 2,800J µg/kg), dibenzo(a,h)anthracene (up to 170J µg/kg), dibenzofuran (up to 14,000J µg/kg), fluoranthene (up to 22,000 µg/kg), indeno(1,2,3-cd)pyrene (up to 440 µg/kg), naphthalene (up to 45,000 µg/kg), phenanthrene (up to 47,000 µg/kg), and pyrene (up to 12,000 µg/kg) (Ref. 75, Appendix B, p. B-4). In addition to SVOCs, EPA analyzed the creosote-contaminated sediment stockpile samples for Toxicity Characteristic Leaching Procedure (TCLP) SVOCs and metals. No contaminants were detected at concentrations exceeding TCLP criteria; therefore, EPA classified the creosote-contaminated sediment pile as Non-RCRA hazardous waste and removed the pile to an off-site Class B waste management facility in Lake, MS (Refs. 44, p. 42; 70; 75, p. 6, Appendix B, p. B-6). The removal of the entire creosote-contaminated sediment stockpile was completed on September 24, 2010 (Ref. 75, p. 6). EPA also constructed a slurry wall measuring 1,500 feet long, three feet wide, and 30 feet below land surface between the SWP property and the southern bank of Batchelor Creek to prevent further migration of hazardous substances from the SWP property to Batchelor Creek (Refs. 70; 73, p. 6; 75, pp. 4, 5) (see Figure 2 of this HRS documentation record). Concurrent with the sediment stockpile disposal activities, EPA conducted site restoration activities. Along the 1,100-foot removal area, Batchelor Creek was graded and an erosion control fabric was installed along the southern bank of the creek. Limestone rip-rap was also installed along the northern and southern banks and the bottom of the creek. Sod was placed along the top of the southern bank of Batchelor Creek. Site restoration activities were completed on September 24, 2010 and on November 30, 2010 final site conditions were documented (Refs. 70; 75, p. 6).

2.2 SOURCE CHARACTERIZATION

2.2.1 SOURCE IDENTIFICATION

Number of source: 1

Name of source: Stockpile of Partially Treated Waste Material

Source Type: Pile

Description and Location of Source (with reference to a map of the site):

Source No. 1 is a stockpile of partially treated waste material located in the central portion of the SWP property (Refs. 14, pp. 2, 5; 16, pp. 1, 2; 18, p. 4) (see Figure 3 of this HRS documentation record). The estimated volume of sludge originally excavated from three unlined wastewater treatment surface impoundments at the facility and placed in the stockpile is about 8,000 cubic yards (Refs. 14, pp. 2, 3, 5; 51, p. 1; 61, p. 3).

During operations, three unlined wastewater treatment surface impoundments were constructed for disposal of wood preserving treatment sludges and process wastewater (Refs. 9, p. 1; 10, pp. 1, 2; 13, p. 5). In 1986, EPA initiated an emergency response action at SWP to stabilize the three unlined surface impoundments. Approximately 8,000 cubic yards, or 12,000 tons, of bottom sediment sludge were excavated from the impoundments, and the contaminated sludge was stabilized with 70 cubic yards of lime kiln dust. The stabilized sludge was then stockpiled on the property to await treatment or disposal (Refs. 14, pp. 2, 3, 5; 51, pp. 1 through 3; 61, p. 3). Lime kiln dust, or cement kiln dust, can contain various metals and dioxins and furans (Ref. 65, pp. 12, 13). According to a risk assessment study conducted by the Research Triangle Institute on behalf of EPA, the concentrations of dioxins and furans detected in the sampled cement kiln dust are generally well below the concentrations of dioxins and furans scored in this HRS documentation record, some being an order of magnitude below (Refs. 5, Appendix B, Table 14, pp. B-29, B-30, B-31; 19, Table 4, pp. B-4, B-5; 65, pp. 1, 11, 12, 13; see also Tables 2 and 5 of this HRS documentation record). From 1991 to 1994, EPA treated the stockpiled sludge using a slurry phase bioremediation system. A treatability variance was approved and the cleanup goals were modified after several failed attempts to reach land disposal restriction standards for wood preserving waste (K001) (Refs. 16, pp. 1, 2; 43, pp. 3, 4).

After bioremediation was completed in 1994, a containment cell consisting of earthen berms lined with 40-mil high-density polyethylene was constructed in the central portion of the SWP property to contain the partially treated waste. The partially treated waste and debris were placed within the containment cell, with a visqueen layer segregating the treated waste and debris. The containment cell was capped with a 12-inch-thick compacted layer of clay. The clay cap was then covered with 4 inches of topsoil and subsequently fertilized and seeded. The entire containment cell was enclosed with a chain link fence. This remedial action was completed in 1995 (Refs. 16, p. 4; 53, pp. 219 through 223).

Since 1995, Source No. 1 has sunken into the ground and "the surface has weathered" (Refs. 7, p. i; 44, p. 2). In September 2008, borings were advanced throughout the SWP property and within Source No. 1 at depths ranging from 0 and 36 feet bgs. Two boreholes, PILE01 and PILE02, were collected from the center of Source No. 1 (Ref. 47, p. 1, Enclosure 1, p. E1-1, Enclosure 2, pp. E2-1 through E2-29). According to the logs for these two boreholes, solidified lagoon sludge was encountered down to 9 feet bgs. Borehole NWPile, collected from the northwestern corner of Source No. 1, contained free-product weeps from 8 to 10 feet bgs (Ref. 47, Enclosure 1, p. E1-1; 47, Enclosure 2, pp. E2-17, E2-27, E2-28). Samples were not collected from any of the borings (Ref. 64).

Source No. 1 samples collected from 6 inches to 3 feet below the surface of the stockpile during the EPA February 2008 RSE contained anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(k)fluoranthene, naphthalene, phenanthrene, pyrene, and dioxins and furans (Ref. 19, p. 2; 19, Appendix B, Tables 3 and 4, pp. B-3, B-4, B-5) (also see Table 2 of this HRS documentation record).

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

EPA September 2008 Expanded Site Inspection

Background Concentrations

The background samples listed in Table 1 were collected during the EPA September 2008 ESI (Ref. 5, p. 7, Appendix A, Figure 4, p. A-4; 5, Appendix B, Table 1, p. B-1). The background soil samples were collected from a location about 1,000 feet northwest of the center of the SWP property (Ref. 5, Appendix A, Figure 4, p. A-4). The background surface soil sample was collected at a depth of 0 to 1 foot bgs and the background subsurface soil sample was collected at a depth of 1 to 4 feet bgs (Ref. 5, Appendix A, Figure 4, p. A-4; 5, Appendix B, Table 1, p. B-1).

Although not required by the HRS, Source No. 1 samples were compared to background samples and estimated concentrations were adjusted to demonstrate the relative increase of source concentrations above background levels. A background soil sample was not collected during the EPA February 2008 RSE; therefore, samples collected from Source No. 1 during the EPA February 2008 RSE were compared with background soil samples collected during the EPA September 2008 ESI. Samples collected during both investigations were collected using similar sampling procedures (Refs. 5, pp. 7, 8; 5, Appendix C, Logbook 3, p. 1; 19, pp. 2, 3; 19, Appendix C, p. C-2; 22; 63). The background samples were collected in accordance with the EPA Region 4 SESD Field Branch Quality System and Technical Procedures for Soil Sampling, SESDPROC-300-R1 (Refs. 5, pp. 7, 8; 21, p. 5; 22).

The samples were analyzed under the EPA Contract Laboratory Program (CLP) for SVOCs in accordance with EPA CLP Statement of Work (SOW) SOM01.2 and for dioxins and furans in accordance with CLP SOW DLM02.0 (Refs. 5, p. 8, Appendix E, pp. E-1, E-2, E-249, E-250; 21, Appendix B, Table 7, p. B-10; 21, Appendix C, p. C-12; 55; 56). EPA Region 4 SESD reviewed all data according to the contract SOW and EPA guidelines (Ref. 5, Appendix E, pp. E-2, E-250; 42). The minimum reporting limits (MRL) are listed on the analytical data sheets in Reference 5, Appendix E. Each MRL is sample-specific and corresponds to the lowest quantitative point on the calibration curve; it is adjusted for the amount of sample prepared and any dilutions performed, as well as for percent moisture. The MRLs are equivalent to sample quantitation limits (SQL) (Ref. 23). The chain-of-custody records are provided in Reference 20. Logbook notes are available in Reference 5, Appendix C. The location of the background samples is depicted in Reference 5, Appendix A, Figure 4, page A-4, and is described in Reference 5, Appendix B, Table 1, page B-1.

TABLE 1: Analytical Results for Background Samples – September 2008

Station ID	Sample ID	Hazardous Substance	Hazardous Substance Concentration	MRL	References
Background Sample (0 to 1 foot bgs)					
SWPB01	SWP-SS-01A1	Anthracene	2.1J (21) µg/kg	3.9 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-118; 20, p. 1; 39, pp. 8, 14; 41, pp. i, 1
SWPB01	SWP-SS-01A1	Benzo(a)anthracene	11 µg/kg	3.9 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-118; 20, p. 1
SWPB01	SWP-SS-01A1	Benzo(a)pyrene	12 µg/kg	3.9 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-118; 20, p. 1
SWPB01	SWP-SS-01A1	Benzo(k)fluoranthene	11J (11) µg/kg	3.9 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-118; 20, p. 1; 39, p. 8; 40, p. 2; 41, p. 1

TABLE 1: Analytical Results for Background Samples – September 2008					
Station ID	**Sample ID**	**Hazardous Substance**	**Hazardous Substance Concentration**	**MRL**	**References**
SWPB01	SWP-SS-01A1	Chrysene	13 µg/kg	3.9 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-118; 20, p. 1
SWPB01	SWP-SS-01A1	Naphthalene	3.1J (31) µg/kg	3.9 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-118; 20, p. 1; 39, pp. 8, 15; 41, pp. i, 1
SWPB01	SWP-SS-01A1	Phenanthrene	6.8 µg/kg	3.9 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-119; 20, p. 1
SWPB01	SWP-SS-01A1	Pyrene	23 µg/kg	3.9 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-119; 20, p. 1
SWPB01	SWP-SS-01A1	1,2,3,4,6,7,8-HpCDD	81 ng/kg	4.8 ng/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-260; 20, p. 11
SWPB01	SWP-SS-01A1	1,2,3,4,6,7,8-HpCDF	170 ng/kg	4.8 ng/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-260; 20, p. 11
SWPB01	SWP-SS-01A1	1,2,3,4,7,8-HxCDF	6.8 ng/kg	4.8 ng/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-260; 20, p. 11
SWPB01	SWP-SS-01A1	1,2,3,6,7,8-HxCDD	7.0 ng/kg	4.8 ng/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-260; 20, p. 11
Background Sample (1 to 4 feet bgs)					
SWPB01	SWP-SS-01A2	Anthracene	4.2U µg/kg	4.2 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-103; 20, p. 1
SWPB01	SWP-SS-01A2	Benzo(a)anthracene	4.2U µg/kg	4.2 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-103; 20, p. 1
SWPB01	SWP-SS-01A2	Benzo(a)pyrene	4.2U µg/kg	4.2 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-103; 20, p. 1
SWPB01	SWP-SS-01A2	Benzo(k)fluoranthene	4.2U µg/kg	4.2 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-103; 20, p. 1
SWPB01	SWP-SS-01A2	Chrysene	4.2U µg/kg	4.2 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-103; 20, p. 1
SWPB01	SWP-SS-01A2	Naphthalene	4.0J (40) µg/kg	4.2 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-103; 20, p. 1; 39, pp. 8, 15; 41, pp. i, 1
SWPB01	SWP-SS-01A2	Phenanthrene	4.2U µg/kg	4.2 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-104; 20, p. 1
SWPB01	SWP-SS-01A2	Pyrene	4.2U µg/kg	4.2 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-104; 20, p. 1

Notes:

( )	Concentrations shown in parentheses were adjusted in accordance with References 39, 40, and 41.
A1	Sample collected at a depth of 0 to 1 foot bgs
A2	Sample collected at a depth of 1 to 4 feet bgs
B	Background
bgs	Below ground surface
HpCDD	Heptachlorodibenzodioxin
HpCDF	Heptachlorodibenzofuran
HxCDD	Hexachlorodibenzodioxin
HxCDF	Hexachlorodibenzofuran
ID	Identification number
J	Identification of the analyte is acceptable; the reported value is an estimate
µg/kg	Microgram per kilogram
MRL	Minimum reporting limit
ng/kg	Nanogram per kilogram
SS	Surface sample
SWP	Southeastern Wood Preserving

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Source Concentrations

The Source No. 1 samples listed in Table 2 were collected during the EPA February 2008 RSE (Ref. 19, p. 2; 19, Appendix B, Table 1, p. B-1). Source No. 1 (stockpile of partially treated waste material) was divided into three equal sections, and a composite sample was collected from each section (Ref. 19, Appendix A, Figure 2, p. A-2). Source samples were collected from a depth of 6 inches to 3 feet below the surface of the stockpile (Ref. 19, Appendix B, Table 1, p. B-1).

Source No. 1 samples were collected in accordance with the EPA SESD Environmental Investigations Standard Operating Procedures and Quality Assurance Manual, November 2001 (Ref. 19, p. 2; 63, pp. 13-1 through 13-6, 13-11). The samples were analyzed by Pace Analytical Services, Inc., for SVOCs in accordance with SW-846 Method 8270C and for dioxins and furans in accordance with SW-846 Method 8290 (Refs. 19, p. 3, Appendix D, pp. D-1, D-15; 45, p. 4; 46, p. 2; 57; 58). Tetra Tech reviewed all data according to the National Functional Guidelines for Superfund Organic Methods Data Review and Chlorinated Dioxin/Furan Data Review (Ref. 19, p. 2, Appendix D, pp. D-1, D-15). The reporting limits (RL) are listed on the analytical data sheets in References 45 and 46. Each RL is sample-specific and corresponds to the lowest quantitative point on the calibration curve; it is adjusted for the amount of sample prepared and any dilutions performed, as well as for percent moisture. The RLs are equivalent to SQLs (Ref. 49). The data validation reports are provided in Reference 19, Appendix D. The chain-of-custody records are provided in References 45 and 46. Logbook notes are available in Reference 19, Appendix C. The locations of Source No. 1 samples are depicted in Reference 19, Appendix A, Figure 2, page A-2, and are described in Reference 19, Appendix B, Table 1, page B-1.

TABLE 2: Analytical Results for Source No. 1 – February 2008

Sample ID	Hazardous Substance	Hazardous Substance Concentration	RL*	References
Source Samples (6 to 24 inches bps)				
SWP-WS-02	Benzo(a)anthracene	459 µg/kg	435 µg/kg	19, Appendix C, p. 3; 45, pp. 5, 332
SWP-WS-02	Benzo(a)pyrene	714 µg/kg	435 µg/kg	19, Appendix C, p. 3; 45, pp. 5, 332
SWP-WS-02	Benzo(k)fluoranthene	467 µg/kg	435 µg/kg	19, Appendix C, p. 3; 45, pp. 5, 332
SWP-WS-02	Chrysene	829 µg/kg	435 µg/kg	19, Appendix C, p. 3; 45, pp. 5, 332
SWP-WS-02	Naphthalene	883 µg/kg	435 µg/kg	19, Appendix C, p. 3; 45, pp. 6, 332
SWP-WS-02	Phenanthrene	681 µg/kg	435 µg/kg	19, Appendix C, p. 3; 45, pp. 7, 332
SWP-WS-02	Pyrene	774 µg/kg	435 µg/kg	19, Appendix C, p. 3; 45, pp. 7, 332
SWP-WS-02	1,2,3,4,6,7,8-HpCDD	1,600J (160) ng/kg	1.90 ng/kg	19, Appendix C, p. 3; 19, Appendix D, pp. D-5, D-10; 41, p. 2; 46, pp. 7, 38
SWP-WS-02D	Benzo(a)anthracene	455 µg/kg	423 µg/kg	19, Appendix C, p. 3; 45, pp. 8, 332
SWP-WS-02D	Benzo(a)pyrene	639 µg/kg	423 µg/kg	19, Appendix C, p. 3; 45, pp. 8, 332
SWP-WS-02D	Benzo(k)fluoranthene	497 µg/kg	423 µg/kg	19, Appendix C, p. 3; 45, pp. 8, 332
SWP-WS-02D	Chrysene	792 µg/kg	423 µg/kg	19, Appendix C, p. 3; 45, pp. 8, 332
SWP-WS-02D	Naphthalene	723 µg/kg	423 µg/kg	19, Appendix C, p. 3; 45, pp. 9, 332

TABLE 2: Analytical Results for Source No. 1 – February 2008				
Sample ID	**Hazardous Substance**	**Hazardous Substance Concentration**	**RL***	**References**
SWP-WS-02D	Phenanthrene	1,110 µg/kg	423 µg/kg	19, Appendix C, p. 3; 45, pp. 10, 332
SWP-WS-02D	Pyrene	891 µg/kg	423 µg/kg	19, Appendix C, p. 3; 45, pp. 10, 332
SWP-WS-02D	1,2,3,4,6,7,8-HpCDD	13,000J (1,300) ng/kg	6.30 ng/kg	19, Appendix C, p. 3; 19, Appendix D, pp. D-5, D-11; 41, p. 2; 46, pp. 7, 39
SWP-WS-02D	1,2,3,4,6,7,8-HpCDF	4,700J (470) ng/kg	2.80 ng/kg	19, Appendix C, p. 3; 19, Appendix D, pp. D-5, D-11; 41, p. 2; 46, pp. 7, 39
Source Sample (20 to 24 inches bps)				
SWP-WS-03	Anthracene	4,830 µg/kg	1,990 µg/kg	19, Appendix C, p. 4; 45, pp. 11, 332
SWP-WS-03	Benzo(a)pyrene	5,440 µg/kg	1,990 µg/kg	19, Appendix C, p. 4; 45, pp. 11, 332
SWP-WS-03	Benzo(k)fluoranthene	4,340 µg/kg	1,990 µg/kg	19, Appendix C, p. 4; 45, pp. 11, 332
SWP-WS-03	Chrysene	3,760 µg/kg	1,990 µg/kg	19, Appendix C, p. 4; 45, pp. 11, 332
SWP-WS-03	Pyrene	3,090 µg/kg	1,990 µg/kg	19, Appendix C, p. 4; 45, pp. 13, 332
SWP-WS-03	1,2,3,4,6,7,8-HpCDD	13,000 ng/kg	5.70 ng/kg	19, Appendix C, p. 4; 46, pp. 7, 40
SWP-WS-03	1,2,3,4,6,7,8-HpCDF	4,700 ng/kg	3.60 ng/kg	19, Appendix C, p. 4; 46, pp. 7, 40
SWP-WS-03	1,2,3,4,7,8-HxCDF	140 ng/kg	1.20 ng/kg	19, Appendix C, p. 4; 46, pp. 7, 40
SWP-WS-03	1,2,3,6,7,8-HxCDD	360 ng/kg	1.40 ng/kg	19, Appendix C, p. 4; 46, pp. 7, 40
Source Sample (3 feet bps)				
SWP-WS-01	Benzo(a)pyrene	452 µg/kg	423 µg/kg	19, Appendix C, p. 2; 45, pp. 20, 332

Notes:

*	The February 2008 RLs are equivalent to sample quantitation limits (Ref. 49).
( )	Concentrations shown in parentheses were adjusted in accordance with References 39, 40, and 41.
bps	Below pile surface
D	Duplicate
HpCDD	Heptachlorodibenzodioxin
HpCDF	Heptachlorodibenzofuran
HxCDD	Hexachlorodibenzodioxin
HxCDF	Hexachlorodibenzofuran
ID	Identification number
J	Identification of the analyte is acceptable; the reported value is an estimate
µg/kg	Microgram per kilogram
ng/kg	Nanogram per kilogram
RL	Reporting limit
SWP	Southeastern Wood Preserving
WS	Waste sample

2.2.3 HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY

Source samples collected from Source No. 1 contained SVOCs and dioxins and furans (Ref. 19, Appendix A, Figure 2, p. A-2; 19, Appendix D, pp. D-1, D-14, D-15 D-46, D-47) (also see Table 1 of this HRS documentation record). Source No. 1 is a stockpile of partially treated waste material (Refs. 18, p. 4; 14, pp. 2, 5; 16, pp. 1, 2; 19, Appendix B, Table 3, p. B-3). Analytical results for sediment samples collected from Batchelor Creek, which receives runoff from Source No. 1, indicate that a release of hazardous substances has occurred to the surface water migration pathway as documented in Section 4.0 of this HRS documentation record. While a section of Batchelor Creek has been remediated, a release of hazardous substances from the site has been documented downstream from the remediated section (Refs. 5, Appendix A, Figure 4, p. A-4, Appendix B, Table 23, pp. B-48, B-49; 62; 75, p. 3) (see also Figure 2 of this HRS documentation record). Although Source No. 1 is located within a containment cell, free-phase creosote has been observed leaching into Batchelor Creek in the area downgradient from Source No. 1 (Refs. 5, Appendix C, Logbook 1, p. 47, Logbook 2, p. 4; 5, Appendix D, p. D-8; 7, pp. 1, 2; 14, p. 5; 19, Appendix C, p. 5). Staining was observed in borings advanced in Source No. 1 during the 2008 EPA boring investigation (Ref. 47, Enclosure 2, pp. E2-27, E2-28). Furthermore, no run-on or runoff control systems were observed during the EPA September 2008 ESI sampling event (Refs. 5, Appendix C, pp. C-1 through C-5; 25). The removal action conducted by EPA from 2009 to 2010 included the placement of a slurry wall between the SWP source areas and Batchelor Creek to prevent further migration of creosote; it did not, however, include actual removal of Source No. 1 or construction of any run-on control or runoff management features (Refs. 62; 75, pp. 4, 5). Therefore, a containment factor value of 10 as noted in Table 3 was assigned for the surface water migration pathway (Ref. 1, Section 4.1.2.1.2.1.1).

TABLE 3: Containment Factors for Source No. 1

Containment Description	Containment Factor Value	References
Gas release to air	NS	NA
Particulate release to air	NS	NA
Release to ground water	NS	NA
Release via overland migration or flood: no maintained engineered cover; no functioning and maintained run-on control system or runoff management system.	10	1, Section 4.1.2.1.2.1.1; 5, Appendix B, Tables 8 through 14, pp. B-11 through B-31; 5, Appendix C, Logbook 1, p. 47; 5, Appendix C, Logbook 2, p. 4; 5, Appendix D, p. D-8; 7, pp. i, 1, 2; 14, pp. 2, 5; 16, pp. 1, 2; 19, Appendix C, p. 5; 25; 62

Notes:

NA Not applicable
NS Not scored

2.4.2.1 SOURCE HAZARDOUS WASTE QUANTITY

2.4.2.1.1 Hazardous Constituent Quantity

The information available is not sufficient to evaluate Tier A, hazardous constituent quantity, as required by Reference 1, Section 2.4.2.1.1.

Hazardous Constituent Quantity Assigned Value: NS

2.4.2.1.2 Hazardous Wastestream Quantity

About 8,000 cubic yards (cy) of bottom sediment sludge were excavated from the three surface impoundments (Refs. 14, pp. 3, 5; 51, p. 1; 61, p. 3). However, an unquantified amount of contaminated soil excavated from Batchelor Creek during the 1989 SCS creek widening project was added to this wastestream while it was stockpiled onsite (Ref. 9, p. 4). Therefore, the Hazardous Wastestream Quantity is not adequately determined for the source; a value for hazardous wastestream quantity is assigned based on the available data and the evaluation proceeds to section 2.4.2.1.3 (Ref. 1, Section 2.4.2.1.2).

8,000 cy x 2,000 pounds/cy (Ref. 1, Table 2-5) = 16,000,000 pounds
Equation for Assigning Value (Ref. 1, Table 2-5): Wastestream Quantity (W) / 5,000

Hazardous Wastestream Quantity Assigned Value: 3,200

2.4.2.1.3 Volume

Volume information is not available to evaluate Tier C.

Volume Assigned Value: 0

2.4.2.1.4 Area

During the February 2008 RSE, the area of Source No. 1 was measured using global positioning system coordinates. The area is 79,549.6 square feet, or 1.82 acres (Refs. 19, p. 3; 48).

Area (ft^2): 79,549.60 (Ref. 19, p. 3)
Equation for Assigning Value (Ref. 1, Table 2-5): Area (A) / 13

Area Assigned Value: 6,119.2

2.4.2.1.5 Calculation of Source Hazardous Waste Quantity Value

A source hazardous waste quantity (HWQ) value of 6,119.2 is assigned for Source No. 1 (Ref. 1, Section 2.4.2.1.5).

Source HWQ Value: 6,119.2

2.2 SOURCE CHARACTERIZATION

2.2.1 SOURCE IDENTIFICATION

Number of source: 2

Name of source: Contaminated soil located on the SWP property

Source Type: Contaminated soil

Description and Location of Source (with reference to a map of site):

Source No. 2 is an area of contaminated soil located on the SWP property (see Figure 3 of this HRS documentation record). From 1928 to 1979, wood treating operations occurred on the SWP property (Refs. 8, p. 5; 9, p. 1). During former operations, southern yellow pine timbers were stripped of bark and placed in retort cylinders for drying. Wood preservatives, hot creosote or PCP, were pumped into the cylinders. The cylinders were pressurized to force the liquid into the wood until saturation. The wood was then removed to drip dry on the western portion of the property, and the residual liquid was drained (Ref. 10, p. 2; 11, p. 1; 12, p. 1). When operations ceased, the property included large areas of contamination in the treatment and storage areas, as well as piles of contaminated soil, creosote sludge storage tanks, and three unlined wastewater surface impoundments that had been filled by a previous owner at an unspecified time (Ref. 9, p. 1).

In 2007, EPA SESD personnel advanced soil borings from 0 to 32 feet bgs along the northern border of the property, between the stockpile, former lagoons, and Batchelor Creek, to evaluate whether free-phase creosote was entering Batchelor Creek (Ref. 18, pp. 4, 5, 15 through 30). Visible and odorous impacts (believed to be organic contamination) to the soil were observed in several of the borings adjacent to and west of the stockpile. In addition, free-phase creosote was observed at 6 feet bgs in at least one boring located adjacent to the stockpile (Ref. 18, pp. 6, 12, 19).

In September 2008, EPA advanced 29 boreholes between 0 and 36 feet bgs throughout the SWP property and within the stockpile. Free product (creosote) was noted in 14 of the 29 boreholes (Ref. 47, p. 1, Enclosure 1, p. E1-1, Enclosure 2, pp. E2-1 through E2-29).

Hazardous substances detected in Source No. 2 include SVOCs and dioxins and furans (see Table 5 of this HRS documentation record). The same hazardous substances detected in Source No. 2 were also detected in the stockpile (Source No. 1) (Refs. 5, Appendix B, Table 8, pp. B-11 through B-16; 5, Appendix B, Tables 10 through 13, pp. B-19 through B-28; 5, Appendix B, Table 14, pp. B-29, B-30, B-31; 5, Appendix E; 19, Appendix B, Table 3, p. B-3; 45, pp. 5 through 11, 13, 20; 46, pp. 38, 39, 40, 43) (see Table 2 of this HRS documentation record).

Soil samples collected from Source No. 2 contained elevated concentrations of anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(k)fluoranthene; chrysene; dibenzo(a,h)anthracene; dibenzofuran; indeno(1,2,3-cd)pyrene; pentachlorophenol; phenanthrene; pyrene; 1,2,3,4,6,7,8-HpCDD; 1,2,3,4,6,7,8-HpCDF; 1,2,3,4,7,8-HxCDF; and 1,2,3,6,7,8-HxCDD (Ref. 5, Appendix B, Table 8, pp. B-11 through B-16; 5, Appendix B, Tables 10 through 13, pp. B-19 through B-28; 5, Appendix B, Table 14, pp. B-29, B-30, B-31; 5, Appendix E) (see Table 5 of this HRS documentation record). Hazardous substance concentrations in samples that are greater than or equal to three times the background concentration or that are greater than or equal to the sample-specific and analyte-specific MRL if not detected in the background sample are considered elevated.

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

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Background Concentrations

Although not required by the HRS, the Source No. 2 samples were compared to background samples and estimated concentrations were adjusted to show the relative increase of source concentrations over background levels. The background soil samples listed in Table 4 were collected during the EPA September 2008 ESI (Ref. 5, p. 7, Appendix A, Figure 4, p. A-4; 5, Appendix B, Table 1, pp. B-1, B-2). The background soil samples were collected from a location about 1,000 feet north-northwest of the center of the SWP property (Ref. 5, Appendix A, Figure 4, p. A-4). The background surface soil sample was collected at a depth of 0 to 1 foot bgs (Ref. 5, Appendix A, Figure 4, p. A-4; 5, Appendix B, Table 1, pp. B-1, B-2). Background subsurface soil samples were collected at multiple depth intervals: 1 to 4 feet, 4 to 8 feet, 8 to 12 feet, 12 to 16 feet, and 16 to 20 feet bgs (Refs. 5, Appendix B, Table 1, pp. B-1, B-2). The background samples will be compared with Source No. 2 samples collected at corresponding depths.

Background and Source No. 2 surface and subsurface soil samples were collected during the same sampling event and in accordance with the same sampling procedures (Refs. 5, pp. 7, 8, Appendix A, Figure 4, p. A-4; 5, Appendix B, Table 1, pp. B-1, B-2; 21, p. 5). Surface and subsurface soil samples were collected in accordance with the EPA Region 4 SESD Field Branch Quality System and Technical Procedures for Soil Sampling, SESDPROC-300-R1 (Refs. 5, p. 10; 21, p. 5; 22).

The samples were analyzed under the EPA CLP for SVOCs in accordance with EPA CLP SOW SOM01.2 and for dioxins and furans in accordance with CLP SOW DLM02.0 (Refs. 5, p. 8, Appendix E, pp. E-1, E-2, E-249, E-250; 21, Appendix B, Table 7, p. B-10; 21, Appendix C, p. C-12; 55; 56). EPA Region 4 SESD reviewed all data according to the contract SOW and EPA guidelines (Ref. 5, Appendix E, pp. E-2, E-250; 42). The MRLs are listed on the analytical data sheets in Reference 5, Appendix E. Each MRL is sample-specific and corresponds to the lowest quantitative point on the calibration curve; it is adjusted for the amount of sample prepared and any dilutions performed, as well as for percent moisture. The MRLs are equivalent to SQLs (Ref. 23). The chain-of-custody records are provided in Reference 20. Logbook notes are available in Reference 5, Appendix C. The location of the background samples are depicted in Reference 5, Appendix A, Figure 4, page A-4, and described in Reference 5, Appendix B, Table 1, page B-1.

TABLE 4: Analytical Results for Background Samples – September 2008

Station ID	Sample ID	Hazardous Substance	Hazardous Substance Concentration	MRL	References
Background Sample (0 to 1 foot bgs)					
SWPB01	SWP-SS-01A1	Benzo(a)anthracene	11 µg/kg	3.9 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-118; 20, p. 1
SWPB01	SWP-SS-01A1	Benzo(a)pyrene	12 µg/kg	3.9 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-118; 20, p. 1
SWPB01	SWP-SS-01A1	Benzo(k)fluoranthene	11J (11) µg/kg	3.9 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-118; 20, p. 1; 39, p. 8; 40, p. 2; 41, p. 1
SWPB01	SWP-SS-01A1	Chrysene	13 µg/kg	3.9 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-118; 20, p. 1
SWPB01	SWP-SS-01A1	Dibenzofuran	200U µg/kg	200 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-118; 20, p. 1

TABLE 4: Analytical Results for Background Samples – September 2008					
Station ID	**Sample ID**	**Hazardous Substance**	**Hazardous Substance Concentration**	**MRL**	**References**
SWPB01	SWP-SS-01A1	Indeno(1,2,3-cd)pyrene	7.3J (73) µg/kg	3.9 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-118; 20, p. 1; 39, pp. 8, 15; 40, p. 2; 41, p. 1
SWPB01	SWP-SS-01A1	Phenanthrene	6.8 µg/kg	3.9 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-119; 20, p. 1
SWPB01	SWP-SS-01A1	Pyrene	23 µg/kg	3.9 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-119; 20, p. 1
SWPB01	SWP-SS-01A1	1,2,3,4,6,7,8-HpCDD	81 ng/kg	4.8 ng/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-260; 20, p. 11
SWPB01	SWP-SS-01A1	1,2,3,4,6,7,8-HpCDF	170 ng/kg	4.8 ng/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-260; 20, p. 11
SWPB01	SWP-SS-01A1	1,2,3,4,7,8-HxCDF	6.8 ng/kg	4.8 ng/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-260; 20, p. 11
SWPB01	SWP-SS-01A1	1,2,3,6,7,8-HxCDD	7.0 ng/kg	4.8 ng/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-260; 20, p. 11
Background Sample (1 to 4 feet bgs)					
SWPB01	SWP-SB-01A2	Anthracene	4.2U µg/kg	4.2 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-103; 20, p. 1
SWPB01	SWP-SB-01A2	Benzo(a)anthracene	4.2U µg/kg	4.2 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-103; 20, p. 1
SWPB01	SWP-SB-01A2	Benzo(a)pyrene	4.2U µg/kg	4.2 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-103; 20, p. 1
SWPB01	SWP-SB-01A2	Benzo(k)fluoranthene	4.2U µg/kg	4.2 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-103; 20, p. 1
SWPB01	SWP-SB-01A2	Chrysene	4.2U µg/kg	4.2 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-103; 20, p. 1
SWPB01	SWP-SB-01A2	Dibenzofuran	210U µg/kg	210 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-103; 20, p. 1
SWPB01	SWP-SB-01A2	Phenanthrene	4.2U µg/kg	4.2 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-104; 20, p. 1
SWPB01	SWP-SB-01A2	Pyrene	4.2U µg/kg	4.2 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-104; 20, p. 1
Background Sample (4 to 8 feet bgs)					
SWPB01	SWP-SB-01B	Anthracene	4.0U µg/kg	4.0 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-106; 20, p. 1
SWPB01	SWP-SB-01B	Benzo(a)anthracene	4.0U µg/kg	4.0 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-106; 20, p. 1

TABLE 4: Analytical Results for Background Samples – September 2008					
Station ID	**Sample ID**	**Hazardous Substance**	**Hazardous Substance Concentration**	**MRL**	**References**
SWPB01	SWP-SB-01B	Benzo(a)pyrene	4.0U µg/kg	4.0 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-106; 20, p. 1
SWPB01	SWP-SB-01B	Benzo(k)fluoranthene	4.0U µg/kg	4.0 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-106; 20, p. 1
SWPB01	SWP-SB-01B	Chrysene	4.0U µg/kg	4.0 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-106; 20, p. 1
SWPB01	SWP-SB-01B	Dibenzofuran	210U µg/kg	210 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-106; 20, p. 1
SWPB01	SWP-SB-01B	Phenanthrene	4.0U µg/kg	4.0 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-107; 20, p. 1
SWPB01	SWP-SB-01B	Pyrene	4.0U µg/kg	4.0 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-107; 20, p. 1
Background Sample (8 to 12 feet bgs)					
SWPB01	SWP-SB-01C	Anthracene	3.9U µg/kg	3.9 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-109; 20, p. 1
SWPB01	SWP-SB-01C	Benzo(a)anthracene	3.9U µg/kg	3.9 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-109; 20, p. 1
SWPB01	SWP-SB-01C	Benzo(a)pyrene	3.9U µg/kg	3.9 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-109; 20, p. 1
SWPB01	SWP-SB-01C	Benzo(k)fluoranthene	3.9U µg/kg	3.9 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-109; 20, p. 1
SWPB01	SWP-SB-01C	Chrysene	3.9U µg/kg	3.9 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-109; 20, p. 1
SWPB01	SWP-SB-01C	Dibenzofuran	200U µg/kg	200 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-109; 20, p. 1
SWPB01	SWP-SB-01C	Phenanthrene	3.9U µg/kg	3.9 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-110; 20, p. 1
SWPB01	SWP-SB-01C	Pyrene	3.9U µg/kg	3.9 µg/kg	5, Appendix C, Logbook 1, p. 5; 5, Appendix E, p. E-110; 20, p. 1
Background Sample (12 to 16 feet bgs)					
SWPB01	SWP-SB-01D	Anthracene	4.0U µg/kg	4.0 µg/kg	5, Appendix C, Logbook 1, p. 7; 5, Appendix E, p. E-112; 20, p. 1
SWPB01	SWP-SB-01D	Benzo(a)anthracene	4.0U µg/kg	4.0 µg/kg	5, Appendix C, Logbook 1, p. 7; 5, Appendix E, p. E-112; 20, p. 1
SWPB01	SWP-SB-01D	Benzo(a)pyrene	4.0U µg/kg	4.0 µg/kg	5, Appendix C, Logbook 1, p. 7; 5, Appendix E, p. E-112; 20, p. 1
SWPB01	SWP-SB-01D	Benzo(k)fluoranthene	4.0U µg/kg	4.0 µg/kg	5, Appendix C, Logbook 1, p. 7; 5, Appendix E, p. E-112; 20, p. 1

TABLE 4: Analytical Results for Background Samples – September 2008					
Station ID	**Sample ID**	**Hazardous Substance**	**Hazardous Substance Concentration**	**MRL**	**References**
SWPB01	SWP-SB-01D	Chrysene	4.0U µg/kg	4.0 µg/kg	5, Appendix C, Logbook 1, p. 7; 5, Appendix E, p. E-112; 20, p. 1
SWPB01	SWP-SB-01D	Phenanthrene	4.0U µg/kg	4.0 µg/kg	5, Appendix C, Logbook 1, p. 7; 5, Appendix E, p. E-113; 20, p. 1
Background Sample (16 to 20 feet bgs)					
SWPB01	SWP-SB-01E	Benzo(a)pyrene	110U µg/kg	110 µg/kg	5, Appendix C, Logbook 1, p. 7; 5, Appendix E, p. E-115; 20, p. 4
SWPB01	SWP-SB-01E	Dibenzo(a,h)anthracene	110U µg/kg	110 µg/kg	5, Appendix C, Logbook 1, p. 7; 5, Appendix E, p. E-115; 20, p. 4
SWPB01	SWP-SB-01E	Dibenzofuran	2,600U µg/kg	2,600 µg/kg	5, Appendix C, Logbook 1, p. 7; 5, Appendix E, p. E-115; 20, p. 4
SWPB01	SWP-SB-01E	Pentachlorophenol	210U µg/kg	210 µg/kg	5, Appendix C, Logbook 1, p. 7; 5, Appendix E, p. E-116; 20, p. 4
SWPB01	SWP-SB-01E	Phenanthrene	640 µg/kg	110 µg/kg	5, Appendix C, Logbook 1, p. 7; 5, Appendix E, p. E-116; 20, p. 4
SWPB01	SWP-SB-01E	Pyrene	330 µg/kg	110 µg/kg	5, Appendix C, Logbook 1, p. 7; 5, Appendix E, p. E-116; 20, p. 4

Notes:

( )	Concentrations shown in parentheses were adjusted in accordance with References 39, 40, and 41.
A1	Sample collected at a depth of 0 to 1 foot bgs
A2	Sample collected at a depth of 1 to 4 feet bgs
B	Sample collected at a depth of 4 to 8 feet bgs
bgs	Below ground surface
C	Sample collected at a depth of 8 to 12 feet bgs
D	Sample collected at a depth of 12 to 16 feet bgs
E	Sample collected at a depth of 16 to 20 feet bgs
HpCDD	Heptachlorodibenzodioxin
HpCDF	Heptachlorodibenzofuran
HxCDD	Hexachlorodibenzodioxin
HxCDF	Hexachlorodibenzofuran
ID	Identification number
J	Identification of the analyte is acceptable; the reported value is an estimate.
µg/kg	Microgram per kilogram
MRL	Minimum reporting limit
ng/kg	Nanogram per kilogram
SB	Subsurface sample
SS	Surface sample
SWP	Southeastern Wood Preserving
SWPB	Southeastern Wood Preserving background
U	The analyte was not detected at or above the reporting limit.

Source Concentrations

The Source No. 2 samples listed in Table 5 were collected during the EPA September 2008 ESI (Ref. 5, pp. 7, 10, Appendix A, Figure 4, p. A-4; 5, Appendix B, Table 1, pp. B-1, B-2). The samples were collected on the SWP property (Ref. 21, p. 6). A surface soil sample was collected from each location at a depth of 0 to 1 foot bgs (Ref. 5, Appendix A, Figure 4, p. A-4; 5, Appendix B, Table 1, pp. B-1, B-2). Subsurface soil samples were collected from one or more of the following depth intervals: 1 to 4 feet, 4 to 8 feet, 8 to 12 feet, 12 to 16 feet, and 16 to 20 feet bgs (Ref. 5, Appendix B, Table 1, pp. B-1, B-2).

Source No. 2 samples were collected in accordance with the EPA Region 4 SESD Field Branch Quality System and Technical Procedures, Soil Sampling (Refs. 5, p. 10; 21, p. 5; 22). Samples collected from Source No. 2 were analyzed under the EPA CLP for SVOCs in accordance with CLP SOW SOM01.2. In addition, selected samples were also analyzed for dioxins and furans in accordance with the CLP SOW DLM02.0 (Refs. 5, p. 8; 5, Appendix E, pp. E-1, E-2, E-249, E-250; 21, Appendix B, Table 7, p. B-10; 21, Appendix C, p. C-12; 55; 56). EPA Region 4 SESD reviewed all data according to the contract SOW and EPA guidelines (Ref. 5, Appendix E, pp. E-2, E-250; 42). The MRLs are listed on the analytical data sheets in Reference 5, Appendix E. Each MRL is sample-specific and corresponds to the lowest quantitative point on the calibration curve; it is adjusted for the amount of sample prepared and any dilutions performed, as well as for percent moisture. The MRLs are equivalent to SQLs (Ref. 23). The chain-of-custody records are provided in Reference 20. Logbook notes are available in Reference 5, Appendix C. The locations of Source No. 2 samples are depicted in Reference 5, Appendix A, Figure 4, page A-4 and are described in Reference 5, Appendix B, Table 1, pages B-1 and B-2.

TABLE 5: Analytical Results for Source No. 2– September 2008

Station ID	Sample ID	Hazardous Substance	Hazardous Substance Concentration	MRL	References
Source Samples (0 to 1 foot bgs)					
SWP02	SWP-SS-02-A1	Benzo(a)anthracene	220 µg/kg	180 µg/kg	5, Appendix C, Logbook 1, p. 31; 5, Appendix E, p. E-16; 20, p. 9
SWP02	SWP-SS-02-A1	Benzo(a)pyrene	360 µg/kg	180 µg/kg	5, Appendix C, Logbook 1, p. 31; 5, Appendix E, p. E-16; 20, p. 9
SWP02	SWP-SS-02-A1	Benzo(k)fluoranthene	520 µg/kg	180 µg/kg	5, Appendix C, Logbook 1, p. 31; 5, Appendix E, p. E-16; 20, p. 9
SWP02	SWP-SS-02-A1	Chrysene	390 µg/kg	180 µg/kg	5, Appendix C, Logbook 1, p. 31; 5, Appendix E, p. E-16; 20, p. 9
SWP02	SWP-SS-02-A1	Indeno(1,2,3-cd)pyrene	870 µg/kg	180 µg/kg	5, Appendix C, Logbook 1, p. 31; 5, Appendix E, p. E-16; 20, p. 9
SWP02	SWP-SS-02-A1	Phenanthrene	460 µg/kg	180 µg/kg	5, Appendix C, Logbook 1, p. 31; 5, Appendix E, p. E-17; 20, p. 9
SWP02	SWP-SS-02-A1	Pyrene	670 µg/kg	180 µg/kg	5, Appendix C, Logbook 1, p. 31; 5, Appendix E, p. E-17; 20, p. 9
SWP03	SWP-SS-03A1	Benzo(a)anthracene	3,200 µg/kg	1,200 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-22; 20, p. 8

TABLE 5: Analytical Results for Source No. 2– September 2008					
Station ID	**Sample ID**	**Hazardous Substance**	**Hazardous Substance Concentration**	**MRL**	**References**
SWP03	SWP-SS-03A1	Benzo(a)pyrene	2,200 µg/kg	1,200 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-22; 20, p. 8
SWP03	SWP-SS-03A1	Benzo(k)fluoranthene	2,500 µg/kg	1,200 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-22; 20, p. 8
SWP03	SWP-SS-03A1	Chrysene	4,500 µg/kg	1,200 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-22; 20, p. 8
SWP03	SWP-SS-03A1	Indeno(1,2,3-cd)pyrene	1,800 µg/kg	1,200 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-22; 20, p. 8
SWP03	SWP-SS-03A1	Phenanthrene	7,400 µg/kg	1,200 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-23; 20, p. 8
SWP03	SWP-SS-03A1	Pyrene	7,900 µg/kg	1,200 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-23; 20, p. 8
SWP04	SWP-SS-04A1	Benzo(a)anthracene	19,000 µg/kg	2,600 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-31; 20, p. 7
SWP04	SWP-SS-04A1	Benzo(a)pyrene	27,000 µg/kg	2,600 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-31; 20, p. 7
SWP04	SWP-SS-04A1	Benzo(k)fluoranthene	30,000 µg/kg	2,600 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-31; 20, p. 7
SWP04	SWP-SS-04A1	Chrysene	23,000 µg/kg	2,600 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-31; 20, p. 7
SWP04	SWP-SS-04A1	Indeno(1,2,3-cd)pyrene	24,000 µg/kg	2,600 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-31; 20, p. 7
SWP04	SWP-SS-04A1	Phenanthrene	3,100 µg/kg	500 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-32; 20, p. 7
SWP04	SWP-SS-04A1	Pyrene	27,000 µg/kg	2,600 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-32; 20, p. 7
SWP04	SWP-SS-04A1	1,2,3,4,6,7,8-HpCDD	9,500 ng/kg	240 ng/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-254; 20, p. 11
SWP04	SWP-SS-04A1	1,2,3,4,6,7,8-HpCDF	14,000 ng/kg	47 ng/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-254; 20, p. 11
SWP04	SWP-SS-04A1	1,2,3,4,7,8-HxCDF	240 ng/kg	47 ng/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-254; 20, p. 11

TABLE 5: Analytical Results for Source No. 2– September 2008					
Station ID	**Sample ID**	**Hazardous Substance**	**Hazardous Substance Concentration**	**MRL**	**References**
SWP04	SWP-SS-04A1	1,2,3,6,7,8-HxCDD	650 ng/kg	47 ng/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-254; 20, p. 11
SWP05	SWP-SS-05A1	Benzo(a)anthracene	2,000 µg/kg	550 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-37; 20, p. 5
SWP05	SWP-SS-05A1	Benzo(a)pyrene	1,800 µg/kg	550 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-37; 20, p. 5
SWP05	SWP-SS-05A1	Benzo(k)fluoranthene	2,200 µg/kg	550 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-37; 20, p. 5
SWP05	SWP-SS-05A1	Chrysene	3,300 µg/kg	550 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-37; 20, p. 5
SWP05	SWP-SS-05A1	Indeno(1,2,3-cd)pyrene	1,500 µg/kg	550 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-38; 20, p. 5
SWP05	SWP-SS-05A1	Phenanthrene	790 µg/kg	110 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-38; 20, p. 5
SWP05	SWP-SS-05A1	Pyrene	5,000 µg/kg	550 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-38; 20, p. 5
SWP06	SWP-SS-06A1	Benzo(a)anthracene	14,000 µg/kg	2,600 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-43; 20, p. 5
SWP06	SWP-SS-06A1	Benzo(a)pyrene	7,900 µg/kg	2,600µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-43; 20, p. 5
SWP06	SWP-SS-06A1	Benzo(k)fluoranthene	9,900 µg/kg	2,600 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-43; 20, p. 5
SWP06	SWP-SS-06A1	Chrysene	19,000 µg/kg	2,600 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-43; 20, p. 5
SWP06	SWP-SS-06A1	Dibenzofuran	3,300 µg/kg	2,600 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-43; 20, p. 5
SWP06	SWP-SS-06A1	Indeno(1,2,3-cd)pyrene	5,400 µg/kg	2,600 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-43; 20, p. 5
SWP06	SWP-SS-06A1	Phenanthrene	33,000 µg/kg	10,000 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-44; 20, p. 5
SWP06	SWP-SS-06A1	Pyrene	69,000 µg/kg	10,000 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-44; 20, p. 5

TABLE 5: Analytical Results for Source No. 2– September 2008					
Station ID	**Sample ID**	**Hazardous Substance**	**Hazardous Substance Concentration**	**MRL**	**References**
SWP07	SWP-SS-07A1	Benzo(a)anthracene	10,000 µg/kg	2,900 µg/kg	5, Appendix C, Logbook 1, p. 11; 5, Appendix E, p. E-52; 20, p. 4
SWP07	SWP-SS-07A1	Benzo(a)pyrene	13,000 µg/kg	2,900 µg/kg	5, Appendix C, Logbook 1, p. 11; 5, Appendix E, p. E-52; 20, p. 4
SWP07	SWP-SS-07A1	Benzo(k)fluoranthene	13,000 µg/kg	2,200 µg/kg	5, Appendix C, Logbook 1, p. 11; 5, Appendix E, p. E-52; 20, p. 4
SWP07	SWP-SS-07A1	Chrysene	15,000 µg/kg	2,200 µg/kg	5, Appendix C, Logbook 1, p. 11; 5, Appendix E, p. E-52; 20, p. 4
SWP07	SWP-SS-07A1	Indeno(1,2,3-cd)pyrene	7,800 µg/kg	2,200 µg/kg	5, Appendix C, Logbook 1, p. 11; 5, Appendix E, p. E-52; 20, p. 4
SWP07	SWP-SS-07A1	Pyrene	10,000 µg/kg	2,900 µg/kg	5, Appendix C, Logbook 1, p. 11; 5, Appendix E, p. E-53; 20, p. 4
SWP08	SWP-SS-08A1	Benzo(a)anthracene	1,400 µg/kg	930 µg/kg	5, Appendix C, Logbook 1, p. 18; 5, Appendix E, p. E-58; 20, p. 8
SWP08	SWP-SS-08A1	Benzo(a)pyrene	610 µg/kg	93 µg/kg	5, Appendix C, Logbook 1, p. 18; 5, Appendix E, p. E-58; 20, p. 8
SWP08	SWP-SS-08A1	Benzo(k)fluoranthene	690 µg/kg	93 µg/kg	5, Appendix C, Logbook 1, p. 18; 5, Appendix E, p. E-58; 20, p. 8
SWP08	SWP-SS-08A1	Chrysene	1,900 µg/kg	930 µg/kg	5, Appendix C, Logbook 1, p. 18; 5, Appendix E, p. E-58; 20, p. 8
SWP08	SWP-SS-08A1	Dibenzofuran	4,100 µg/kg	2,300 µg/kg	5, Appendix C, Logbook 1, p. 18; 5, Appendix E, p. E-58; 20, p. 8
SWP08	SWP-SS-08A1	Indeno(1,2,3-cd)pyrene	780 µg/kg	93 µg/kg	5, Appendix C, Logbook 1, p. 18; 5, Appendix E, p. E-58; 20, p. 8
SWP08	SWP-SS-08A1	Phenanthrene	17,000 µg/kg	2,300 µg/kg	5, Appendix C, Logbook 1, p. 18; 5, Appendix E, p. E-59; 20, p. 8
SWP08	SWP-SS-08A1	Pyrene	6,800 µg/kg	930 µg/kg	5, Appendix C, Logbook 1, p. 18; 5, Appendix E, p. E-59; 20, p. 8
SWP09	SWP-SS-09A1	Benzo(a)anthracene	22,000 µg/kg	2,600 µg/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-64; 20, p. 8
SWP09	SWP-SS-09A1	Benzo(a)pyrene	17,000 µg/kg	2,600 µg/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-64; 20, p. 8

TABLE 5: Analytical Results for Source No. 2– September 2008					
Station ID	**Sample ID**	**Hazardous Substance**	**Hazardous Substance Concentration**	**MRL**	**References**
SWP09	SWP-SS-09A1	Benzo(k)fluoranthene	24,000 µg/kg	2,600 µg/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-64; 20, p. 8
SWP09	SWP-SS-09A1	Chrysene	30,000 µg/kg	2,600 µg/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-64; 20, p. 8
SWP09	SWP-SS-09A1	Indeno(1,2,3-cd)pyrene	12,000 µg/kg	2,600 µg/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-64; 20, p. 8
SWP09	SWP-SS-09A1	Phenanthrene	6,600 µg/kg	1,000 µg/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-65; 20, p. 8
SWP09	SWP-SS-09A1	Pyrene	14,000 µg/kg	2,600 µg/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-65; 20, p. 8
SWP10	SWP-SS-10A1	Benzo(a)anthracene	35,000 µg/kg	2,300 µg/kg	5, Appendix C, Logbook 2, p. 10; 5, Appendix E, p. E-70; 20, p. 12
SWP10	SWP-SS-10A1	Benzo(a)pyrene	9,500 µg/kg	2,300 µg/kg	5, Appendix C, Logbook 2, p. 10; 5, Appendix E, p. E-70; 20, p. 12
SWP10	SWP-SS-10A1	Benzo(k)fluoranthene	11,000 µg/kg	2,300 µg/kg	5, Appendix C, Logbook 2, p. 10; 5, Appendix E, p. E-70; 20, p. 12
SWP10	SWP-SS-10A1	Chrysene	33,000 µg/kg	2,300 µg/kg	5, Appendix C, Logbook 2, p. 10; 5, Appendix E, p. E-70; 20, p. 12
SWP10	SWP-SS-10A1	Dibenzofuran	64,000 µg/kg	23,000 µg/kg	5, Appendix C, Logbook 2, p. 10; 5, Appendix E, p. E-70; 20, p. 12
SWP10	SWP-SS-10A1	Indeno(1,2,3-cd)pyrene	4,300 µg/kg	2,300 µg/kg	5, Appendix C, Logbook 2, p. 10; 5, Appendix E, p. E-70; 20, p. 12
SWP10	SWP-SS-10A1	Phenanthrene	210,000 µg/kg	23,000 µg/kg	5, Appendix C, Logbook 2, p. 10; 5, Appendix E, p. E-71; 20, p. 12
SWP10	SWP-SS-10A1	Pyrene	82,000 µg/kg	23,000 µg/kg	5, Appendix C, Logbook 2, p. 10; 5, Appendix E, p. E-71; 20, p. 12
SWP11	SWP-SS-11A1	Benzo(a)anthracene	7,100 µg/kg	2,300 µg/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-79; 20, p. 8
SWP11	SWP-SS-11A1	Benzo(a)pyrene	6,900 µg/kg	2,300 µg/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-79; 20, p. 8
SWP11	SWP-SS-11A1	Benzo(k)fluoranthene	7,500 µg/kg	2,300 µg/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-79; 20, p. 8

TABLE 5: Analytical Results for Source No. 2– September 2008					
Station ID	**Sample ID**	**Hazardous Substance**	**Hazardous Substance Concentration**	**MRL**	**References**
SWP11	SWP-SS-11A1	Chrysene	9,600 µg/kg	2,300 µg/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-79; 20, p. 8
SWP11	SWP-SS-11A1	Indeno(1,2,3-cd)pyrene	5,800 µg/kg	2,300 µg/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-79; 20, p. 8
SWP11	SWP-SS-11A1	Phenanthrene	8,000 µg/kg	2,300 µg/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-80; 20, p. 8
SWP11	SWP-SS-11A1	Pyrene	13,000 µg/kg	2,300 µg/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-80; 20, p. 8
SWP11	SWP-SS-11A1	1,2,3,4,6,7,8-HpCDD	2,600 ng/kg	24 ng/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-258; 20, p. 11
SWP11	SWP-SS-11A1	1,2,3,4,6,7,8-HpCDF	1,500 ng/kg	4.9 ng/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-258; 20, p. 11
SWP11	SWP-SS-11A1	1,2,3,4,7,8-HxCDF	33 ng/kg	4.9 ng/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-258; 20, p. 11
SWP11	SWP-SS-11A1	1,2,3,6,7,8-HxCDD	94 ng/kg	4.9 ng/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-258; 20, p. 11
SWP12	SWP-SS-12A1	Benzo(a)anthracene	120 µg/kg	89 µg/kg	5, Appendix C, Logbook 1, p. 9; 5, Appendix E, p. E-85; 20, p. 1
SWP12	SWP-SS-12A1	Benzo(a)pyrene	100 µg/kg	89 µg/kg	5, Appendix C, Logbook 1, p. 9; 5, Appendix E, p. E-85; 20, p. 1
SWP12	SWP-SS-12A1	Benzo(k)fluoranthene	160 µg/kg	89 µg/kg	5, Appendix C, Logbook 1, p. 9; 5, Appendix E, p. E-85; 20, p. 1
SWP12	SWP-SS-12A1	Chrysene	290 µg/kg	89 µg/kg	5, Appendix C, Logbook 1, p. 9; 5, Appendix E, p. E-85; 20, p. 1
SWP12	SWP-SS-12A1	Phenanthrene	190 µg/kg	89 µg/kg	5, Appendix C, Logbook 1, p. 9; 5, Appendix E, p. E-86; 20, p. 1
SWP12	SWP-SS-12A1	Pyrene	300 µg/kg	89 µg/kg	5, Appendix C, Logbook 1, p. 9; 5, Appendix E, p. E-86; 20, p. 1
SWP13	SWP-SS-13A1	Benzo(a)anthracene	700 µg/kg	120 µg/kg	5, Appendix C, Logbook 1, p. 7; 5, Appendix E, p. E-91; 20, p. 1
SWP13	SWP-SS-13A1	Benzo(a)pyrene	510 µg/kg	120 µg/kg	5, Appendix C, Logbook 1, p. 7; 5, Appendix E, p. E-91; 20, p. 1

TABLE 5: Analytical Results for Source No. 2– September 2008					
Station ID	**Sample ID**	**Hazardous Substance**	**Hazardous Substance Concentration**	**MRL**	**References**
SWP13	SWP-SS-13A1	Benzo(k)fluoranthene	780 µg/kg	120 µg/kg	5, Appendix C, Logbook 1, p. 7; 5, Appendix E, p. E-91; 20, p. 1
SWP13	SWP-SS-13A1	Chrysene	1,400 µg/kg	240 µg/kg	5, Appendix C, Logbook 1, p. 7; 5, Appendix E, p. E-91; 20, p. 1
SWP13	SWP-SS-13A1	Indeno(1,2,3-cd)pyrene	730 µg/kg	120 µg/kg	5, Appendix C, Logbook 1, p. 7; 5, Appendix E, p. E-91; 20, p. 1
SWP13	SWP-SS-13A1	Phenanthrene	290 µg/kg	120 µg/kg	5, Appendix C, Logbook 1, p. 7; 5, Appendix E, p. E-92; 20, p. 1
SWP13	SWP-SS-13A1	Pyrene	1,500 µg/kg	240 µg/kg	5, Appendix C, Logbook 1, p. 7; 5, Appendix E, p. E-92; 20, p. 1
SWP13	SWP-SS-13A1	1,2,3,4,6,7,8-HpCDD	6,600 ng/kg	49 ng/kg	5, Appendix C, Logbook 1, p. 7; 5, Appendix E, p. E-259; 20, p. 11
SWP13	SWP-SS-13A1	1,2,3,4,6,7,8-HpCDF	4,500 ng/kg	49 ng/kg	5, Appendix C, Logbook 1, p. 7; 5, Appendix E, p. E-259; 20, p. 11
SWP13	SWP-SS-13A1	1,2,3,4,7,8-HxCDF	170 ng/kg	4.9 ng/kg	5, Appendix C, Logbook 1, p. 7; 5, Appendix E, p. E-259; 20, p. 11
SWP13	SWP-SS-13A1	1,2,3,6,7,8-HxCDD	250 ng/kg	4.9 ng/kg	5, Appendix C, Logbook 1, p. 7; 5, Appendix E, p. E-259; 20, p. 11
SWP14	SWP-SS-14A1	Benzo(a)anthracene	360 µg/kg	130 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-97; 20, p. 5
SWP14	SWP-SS-14A1	Benzo(a)pyrene	560 µg/kg	130 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-97; 20, p. 5
SWP14	SWP-SS-14A1	Benzo(k)fluoranthene	690 µg/kg	130 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-97; 20, p. 5
SWP14	SWP-SS-14A1	Chrysene	620 µg/kg	130 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-97; 20, p. 5
SWP14	SWP-SS-14A1	Indeno(1,2,3-cd)pyrene	460 µg/kg	130 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-97; 20, p. 5
SWP14	SWP-SS-14A1	Phenanthrene	180 µg/kg	130 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-98; 20, p. 5
SWP14	SWP-SS-14A1	Pyrene	590 µg/kg	130 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-98; 20, p. 5

TABLE 5: Analytical Results for Source No. 2– September 2008					
Station ID	**Sample ID**	**Hazardous Substance**	**Hazardous Substance Concentration**	**MRL**	**References**
Source Samples (1 to 4 feet bgs)					
SWP07	SWP-SB-07A2	Anthracene	8,900 µg/kg	2,800 µg/kg	5, Appendix C, Logbook 1, p. 11; 5, Appendix E, p. E-46; 20, p. 4
SWP07	SWP-SB-07A2	Benzo(a)anthracene	14,000 µg/kg	2,800 µg/kg	5, Appendix C, Logbook 1, p. 11; 5, Appendix E, p. E-46; 20, p. 4
SWP07	SWP-SB-07A2	Benzo(a)pyrene	10,000 µg/kg	2,800 µg/kg	5, Appendix C, Logbook 1, p. 11; 5, Appendix E, p. E-46; 20, p. 4
SWP07	SWP-SB-07A2	Benzo(k)fluoranthene	14,000 µg/kg	4,600 µg/kg	5, Appendix C, Logbook 1, p. 11; 5, Appendix E, p. E-46; 20, p. 4
SWP07	SWP-SB-07A2	Chrysene	19,000 µg/kg	4,600 µg/kg	5, Appendix C, Logbook 1, p. 11; 5, Appendix E, p. E-46; 20, p. 4
SWP07	SWP-SB-07A2	Dibenzofuran	7,000 µg/kg	2,800 µg/kg	5, Appendix C, Logbook 1, p. 11; 5, Appendix E, p. E-46; 20, p. 4
SWP07	SWP-SB-07A2	Phenanthrene	23,000 µg/kg	2,800 µg/kg	5, Appendix C, Logbook 1, p. 11; 5, Appendix E, p. E-47; 20, p. 4
SWP07	SWP-SB-07A2	Pyrene	33,000 µg/kg	2,800 µg/kg	5, Appendix C, Logbook 1, p. 11; 5, Appendix E, p. E-47; 20, p. 4
SWP07	SWP-SB-07A2-DUP	Anthracene	46,000 µg/kg	4,800 µg/kg	5, Appendix C, Logbook 1, p. 13; 5, Appendix E, p. E-49; 20, p. 4
SWP07	SWP-SB-07A2-DUP	Benzo(a)anthracene	3,500 µg/kg	2,400 µg/kg	5, Appendix C, Logbook 1, p. 13; 5, Appendix E, p. E-49; 20, p. 4
SWP07	SWP-SB-07A2-DUP	Benzo(a)pyrene	3,500 µg/kg	2,400 µg/kg	5, Appendix C, Logbook 1, p. 13; 5, Appendix E, p. E-49; 20, p. 4
SWP07	SWP-SB-07A2-DUP	Benzo(k)fluoranthene	5,300 µg/kg	2,400 µg/kg	5, Appendix C, Logbook 1, p. 13; 5, Appendix E, p. E-49; 20, p. 4
SWP07	SWP-SB-07A2-DUP	Chrysene	7,100 µg/kg	2,400 µg/kg	5, Appendix C, Logbook 1, p. 13; 5, Appendix E, p. E-49; 20, p. 4
SWP07	SWP-SB-07A2-DUP	Phenanthrene	7,700 µg/kg	2,400 µg/kg	5, Appendix C, Logbook 1, p. 13; 5, Appendix E, p. E-50; 20, p. 4
SWP07	SWP-SB-07A2-DUP	Pyrene	5,100 µg/kg	2,400 µg/kg	5, Appendix C, Logbook 1, p. 13; 5, Appendix E, p. E-50; 20, p. 4

TABLE 5: Analytical Results for Source No. 2– September 2008					
Station ID	**Sample ID**	**Hazardous Substance**	**Hazardous Substance Concentration**	**MRL**	**References**
Source Samples (4 to 8 feet bgs)					
SWP02	SWP-SB-02B	Anthracene	12,000 µg/kg	2,800 µg/kg	5, Appendix C, Logbook 1, p. 31; 5, Appendix E, p. E-13; 20, p. 9
SWP02	SWP-SB-02B	Benzo(a)anthracene	10,000 µg/kg	2,800 µg/kg	5, Appendix C, Logbook 1, p. 31; 5, Appendix E, p. E-13; 20, p. 9
SWP02	SWP-SB-02B	Benzo(a)pyrene	2,000 µg/kg	220 µg/kg	5, Appendix C, Logbook 1, p. 31; 5, Appendix E, p. E-13; 20, p. 9
SWP02	SWP-SB-02B	Benzo(k)fluoranthene	2,000 µg/kg	220 µg/kg	5, Appendix C, Logbook 1, p. 31; 5, Appendix E, p. E-13; 20, p. 9
SWP02	SWP-SB-02B	Chrysene	8,500 µg/kg	2,800 µg/kg	5, Appendix C, Logbook 1, p. 31; 5, Appendix E, p. E-13; 20, p. 9
SWP02	SWP-SB-02B	Dibenzofuran	25,000 µg/kg	2,800 µg/kg	5, Appendix C, Logbook 1, p. 31; 5, Appendix E, p. E-13; 20, p. 9
SWP02	SWP-SB-02B	Phenanthrene	88,000 µg/kg	2,800 µg/kg	5, Appendix C, Logbook 1, p. 31; 5, Appendix E, p. E-14; 20, p. 9
SWP02	SWP-SB-02B	Pyrene	32,000 µg/kg	2,800 µg/kg	5, Appendix C, Logbook 1, p. 31; 5, Appendix E, p. E-14; 20, p. 9
SWP03	SWP-SB-03B	Anthracene	210 µg/kg	120 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-19; 20, p. 8
SWP03	SWP-SB-03B	Benzo(a)anthracene	420 µg/kg	120 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-19; 20, p. 8
SWP03	SWP-SB-03B	Benzo(a)pyrene	290 µg/kg	120 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-19; 20, p. 8
SWP03	SWP-SB-03B	Benzo(k)fluoranthene	270 µg/kg	120 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-19; 20, p. 8
SWP03	SWP-SB-03B	Chrysene	480 µg/kg	120 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-19; 20, p. 8
SWP03	SWP-SB-03B	Phenanthrene	580 µg/kg	120 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-20; 20, p. 8
SWP03	SWP-SB-03B	Pyrene	4,600 µg/kg	3,100 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-20; 20, p. 8

TABLE 5: Analytical Results for Source No. 2– September 2008					
Station ID	**Sample ID**	**Hazardous Substance**	**Hazardous Substance Concentration**	**MRL**	**References**
SWP06	SWP-SB-06B	Benzo(a)anthracene	320 µg/kg	100 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-40; 20, p. 5
SWP06	SWP-SB-06B	Benzo(a)pyrene	220 µg/kg	100 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-40; 20, p. 5
SWP06	SWP-SB-06B	Benzo(k)fluoranthene	240 µg/kg	100 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-40; 20, p. 5
SWP06	SWP-SB-06B	Chrysene	350 µg/kg	100 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-40; 20, p. 5
SWP06	SWP-SB-06B	Pyrene	150 µg/kg	100 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-41; 20, p. 5
SWP10	SWP-SB-10B	Anthracene	100,000 µg/kg	54,000 µg/kg	5, Appendix C, Logbook 2, p. 10; 5, Appendix E, p. E-67; 20, p. 12
SWP10	SWP-SB-10B	Benzo(a)anthracene	66,000 µg/kg	54,000 µg/kg	5, Appendix C, Logbook 2, p. 10; 5, Appendix E, p. E-67; 20, p. 12
SWP10	SWP-SB-10B	Benzo(a)pyrene	11,000 µg/kg	2,700 µg/kg	5, Appendix C, Logbook 2, p. 10; 5, Appendix E, p. E-67; 20, p. 12
SWP10	SWP-SB-10B	Benzo(k)fluoranthene	33,000 µg/kg	2,700 µg/kg	5, Appendix C, Logbook 2, p. 10; 5, Appendix E, p. E-67; 20, p. 12
SWP10	SWP-SB-10B	Chrysene	100,000 µg/kg	54,000 µg/kg	5, Appendix C, Logbook 2, p. 10; 5, Appendix E, p. E-67; 20, p. 12
SWP10	SWP-SB-10B	Dibenzofuran	79,000 µg/kg	54,000 µg/kg	5, Appendix C, Logbook 2, p. 10; 5, Appendix E, p. E-67; 20, p. 12
SWP10	SWP-SB-10B	Phenanthrene	700,000 µg/kg	54,000 µg/kg	5, Appendix C, Logbook 2, p. 10; 5, Appendix E, p. E-68; 20, p. 12
SWP10	SWP-SB-10B	Pyrene	320,000 µg/kg	54,000 µg/kg	5, Appendix C, Logbook 2, p. 10; 5, Appendix E, p. E-68; 20, p. 12
Source Samples (8 to 12 feet bgs)					
SWP04	SWP-SB-04C	Anthracene	24,000 µg/kg	16,000 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-25; 20, p. 7
SWP04	SWP-SB-04C	Benzo(a)anthracene	16,000 µg/kg	3,100 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-25; 20, p. 7

TABLE 5: Analytical Results for Source No. 2– September 2008					
Station ID	**Sample ID**	**Hazardous Substance**	**Hazardous Substance Concentration**	**MRL**	**References**
SWP04	SWP-SB-04C	Benzo(a)pyrene	4,500 µg/kg	600 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-25; 20, p. 7
SWP04	SWP-SB-04C	Benzo(k)fluoranthene	4,900 µg/kg	600 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-25; 20, p. 7
SWP04	SWP-SB-04C	Chrysene	13,000 µg/kg	3,100 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-25; 20, p. 7
SWP04	SWP-SB-04C	Dibenzofuran	65,000 µg/kg	16,000 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-25; 20, p. 7
SWP04	SWP-SB-04C	Phenanthrene	230,000 µg/kg	16,000 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-26; 20, p. 7
SWP04	SWP-SB-04C	Pyrene	80,000 µg/kg	16,000 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-26; 20, p. 7
SWP04	SWP-SB-04C-DUP	Anthracene	26,000 µg/kg	16,000 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-28; 20, p. 7
SWP04	SWP-SB-04C-DUP	Benzo(a)anthracene	13,000 µg/kg	3,100 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-28; 20, p. 7
SWP04	SWP-SB-04C-DUP	Benzo(a)pyrene	4,200 µg/kg	600 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-28; 20, p. 7
SWP04	SWP-SB-04C-DUP	Benzo(k)fluoranthene	4,500 µg/kg	600 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-28; 20, p. 7
SWP04	SWP-SB-04C-DUP	Chrysene	12,000 µg/kg	3,100 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-28; 20, p. 7
SWP04	SWP-SB-04C-DUP	Dibenzofuran	60,000 µg/kg	16,000 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-28; 20, p. 7
SWP04	SWP-SB-04C-DUP	Phenanthrene	220,000 µg/kg	16,000 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-29; 20, p. 7
SWP04	SWP-SB-04C-DUP	Pyrene	69,000 µg/kg	16,000 µg/kg	5, Appendix C, Logbook 1, p. 26; 5, Appendix E, p. E-29; 20, p. 7
SWP08	SWP-SB-08C	Anthracene	380 µg/kg	100 µg/kg	5, Appendix C, Logbook 1, p. 18; 5, Appendix E, p. E-55; 20, p. 8
SWP08	SWP-SB-08C	Benzo(a)anthracene	290 µg/kg	100 µg/kg	5, Appendix C, Logbook 1, p. 18; 5, Appendix E, p. E-55; 20, p. 8

TABLE 5: Analytical Results for Source No. 2– September 2008					
Station ID	**Sample ID**	**Hazardous Substance**	**Hazardous Substance Concentration**	**MRL**	**References**
SWP08	SWP-SB-08C	Benzo(a)pyrene	110 µg/kg	100 µg/kg	5, Appendix C, Logbook 1, p. 18; 5, Appendix E, p. E-55; 20, p. 8
SWP08	SWP-SB-08C	Benzo(k)fluoranthene	150 µg/kg	100 µg/kg	5, Appendix C, Logbook 1, p. 18; 5, Appendix E, p. E-55; 20, p. 8
SWP08	SWP-SB-08C	Chrysene	270 µg/kg	100 µg/kg	5, Appendix C, Logbook 1, p. 18; 5, Appendix E, p. E-55; 20, p. 8
SWP08	SWP-SB-08C	Phenanthrene	3,300 µg/kg	500 µg/kg	5, Appendix C, Logbook 1, p. 18; 5, Appendix E, p. E-56; 20, p. 8
SWP08	SWP-SB-08C	Pyrene	1,100 µg/kg	500 µg/kg	5, Appendix C, Logbook 1, p. 18; 5, Appendix E, p. E-56; 20, p. 8
SWP09	SWP-SB-09C	Anthracene	970,000 µg/kg	610,000 µg/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-61; 20, p. 8
SWP09	SWP-SB-09C	Dibenzofuran	1,600,000J (1,600,000) µg/kg	610,000 µg/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-61; 20, p. 8; 39, p. 8; 40, p. 1; 41, p. 2
SWP09	SWP-SB-09C	Phenanthrene	5,600,000 µg/kg	610,000 µg/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-62; 20, p. 8
SWP09	SWP-SB-09C	Pyrene	1,800,000 µg/kg	610,000 µg/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-62; 20, p. 8
Source Samples (12 to 16 feet bgs)					
SWP05	SWP-SB-05D	Anthracene	200 µg/kg	110 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-34; 20, p. 5
SWP05	SWP-SB-05D	Benzo(a)anthracene	520 µg/kg	220 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-34; 20, p. 5
SWP05	SWP-SB-05D	Benzo(a)pyrene	460 µg/kg	110 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-34; 20, p. 5
SWP05	SWP-SB-05D	Benzo(k)fluoranthene	560 µg/kg	110 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-34; 20, p. 5
SWP05	SWP-SB-05D	Chrysene	670 µg/kg	220 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-34; 20, p. 5
SWP05	SWP-SB-05D	Phenanthrene	320 µg/kg	110 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-35; 20, p. 5

TABLE 5: Analytical Results for Source No. 2– September 2008					
Station ID	**Sample ID**	**Hazardous Substance**	**Hazardous Substance Concentration**	**MRL**	**References**
SWP14	SWP-SB-14D	Benzo(a)anthracene	270 µg/kg	120 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-94; 20, p. 5
SWP14	SWP-SB-14D	Benzo(a)pyrene	330 µg/kg	120 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-94; 20, p. 5
SWP14	SWP-SB-14D	Benzo(k)fluoranthene	400 µg/kg	120 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-94; 20, p. 5
SWP14	SWP-SB-14D	Chrysene	290 µg/kg	120 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-94; 20, p. 5
SWP14	SWP-SB-14D	Phenanthrene	150 µg/kg	120 µg/kg	5, Appendix C, Logbook 1, p. 20; 5, Appendix E, p. E-95; 20, p. 5
Source Sample (16 to 20 feet bgs)					
SWP11	SWP-SB-11E	Benzo(a)pyrene	42,000 µg/kg	2,600 µg/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-76; 20, p. 8
SWP11	SWP-SB-11E	Dibenzo(a,h)anthracene	4,300 µg/kg	2,600 µg/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-76; 20, p. 8
SWP11	SWP-SB-11E	Dibenzofuran	530,000 µg/kg	100,000 µg/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-76; 20, p. 8
SWP11	SWP-SB-11E	Pentachlorophenol	1,800 µg/kg	500 µg/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-77; 20, p. 8
SWP11	SWP-SB-11E	Phenanthrene	1,500,000 µg/kg	100,000 µg/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-77; 20, p. 8
SWP11	SWP-SB-11E	Pyrene	400,000 µg/kg	100,000 µg/kg	5, Appendix C, Logbook 1, p. 14; 5, Appendix E, p. E-77; 20, p. 8

Notes:

( )	Concentrations shown in parentheses were adjusted in accordance with References 39, 40, and 41.
A1	Sample collected at a depth of 0 to 1 foot bgs
A2	Sample collected at a depth of 1 to 4 feet bgs
B	Sample collected at a depth of 4 to 8 feet bgs
bgs	Below ground surface
C	Sample collected at a depth of 8 to 12 feet bgs
D	Sample collected at a depth of 12 to 16 feet bgs
DUP	Duplicate
E	Sample collected at a depth of 16 to 20 feet bgs
HpCDD	Heptachlorodibenzodioxin
HpCDF	Heptachlorodibenzofuran
HxCDD	Hexachlorodibenzodioxin
HxCDF	Hexachlorodibenzofuran
ID	Identification number
J	Identification of the analyte is acceptable; the reported value is an estimate
µg/kg	Microgram per kilogram
MRL	Minimum reporting limit
ng/kg	Nanogram per kilogram
SB	Subsurface sample
SS	Surface sample
SWP	Southeastern Wood Preserving

2.2.3 HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY

The source samples collected from Source No. 2 (contaminated soil located on the SWP property) contained elevated concentrations of SVOCs and dioxins and furans (Ref. 5, Appendix B, Table 8, pp. B-11 through B-16; 5, Appendix B, Tables 10 through 13, pp. B-19 through B-28; 5, Appendix B, Table 14, pp. B-29, B-30, B-31; 5, Appendix E) (also see Table 5 of this HRS documentation record) (see Figure 3 of this HRS documentation record). Analytical results for sediment samples collected from Batchelor Creek, which receives runoff from Source No. 2, indicate that a release of hazardous substances has occurred to the surface water migration pathway, as documented in Section 4.0 of this HRS documentation record. No run-on or runoff control systems were observed during the EPA September 2008 ESI sampling (Refs. 5, Appendix C, Logbook 1; 25; 62). The removal action conducted by EPA from 2009 to 2010 included the placement of a slurry wall between the SWP source areas and Batchelor Creek to prevent further migration of creosote; it did not, however, include the construction of any run-on control or runoff management features (Refs. 62; 75, pp. 4, 5). At the end of the removal action, clean soil was placed over areas impacted by removal activities, such as the former location of the stockpile of sediments from Batchelor Creek (Ref. 44, p. 1). However, this location overlaps only a portion of the area comprising Source No. 2 (see Figures 2 and 3 of this HRS documentation record). As such, and considering the surface and near subsurface depths at which contamination was found in Source No. 2 (see Table 5 of this HRS documentation record), the source is considered to have no maintained engineered cover. Based on the information provided above, a containment factor value of 10, as noted in Table 6, was assigned for Source No. 2 for the surface water migration pathway (Ref. 1, Section 4.1.2.1.2.1.1).

TABLE 6: Containment Factors for Source No. 2

Containment Description	Containment Factor Value	References
Gas release to air	NS	NA
Particulate release to air	NS	NA
Release to ground water	NS	NA
Release via overland migration or flood; No maintained engineered cover; No functioning and maintained run-on control system or runoff management system.	10	1, Section 4.1.2.1.2.1.1; 5, Appendix B, Tables 8 through 14, pp. B-11 through B-31; 5, Appendix C, Logbook 1, p. 47; 5, Appendix C, Logbook 2, p. 4; 5, Appendix D, p. D-8; 7, pp. 1, 2; 14, pp. 2, 5; 16, pp. 1, 2; 25; 44, p. 1; 62

Notes:

NA Not applicable
NS Not scored

2.4.2.1 HAZARDOUS WASTE QUANTITY

2.4.2.1.1 Hazardous Constituent Quantity

The information available is not sufficient to evaluate Tier A, hazardous constituent quantity, as required by Reference 1, Section 2.4.2.1.1.

Hazardous Constituent Quantity Assigned Value: NS

2.4.2.1.2 Hazardous Wastestream Quantity

The information available is not sufficient to evaluate Tier B, hazardous wastestream quantity, as required by Reference 1, Section 2.4.2.1.2.

Hazardous Wastestream Quantity Assigned Value: NS

2.4.2.1.3 Volume

The information available is not sufficient to evaluate Tier C, volume, as required by Reference 1, Section 2.4.2.1.3.

Volume Assigned Value: 0

2.4.2.1.4 Area

It is not known whether contamination in Source No. 2 is continuous between sampling locations (Ref. 5, Appendix B, Table 1, pp. B-1, B-2). Therefore, the area of Source No. 2 is undetermined, but greater than zero.

Sum (square feet [ft^2]): >0
Equation for Assigning Value (Ref. 1, Table 2-5): Area (A)/34,000

Area Assigned Value: >0

2.4.2.1.5 Source Hazardous Waste Quantity Value

Source No. 2 is assigned a source HWQ value of undetermined, but greater than zero (Ref. 1, Section 2.4.2.1.5).

Source HWQ Value: >0

SUMMARY OF SOURCE DESCRIPTIONS

TABLE 7: Summary of Source Descriptions						
			Containment Factor Value by Pathway			
					Air	
Source No.	Source Hazardous Waste Quantity Value	Source Hazardous Constituent Quantity Complete? (Yes/No)	Ground Water (Ref. 1, Table 3-2)	Surface Water Overland/ Flood (Ref. 1, Table 4-2)	Gas (Ref. 1, Table 6-3)	Particulate (Ref. 1, Table 6-9)
1	6,119.2	No	NS	10	NS	NS
2	>0	No	NS	10	NS	NS

Notes:

NS Not scored

Sum of Source Hazard Waste Quantity Values: 6,119

Other Possible Sources

King Lumber: The current SWP property was originally part of a larger property owned by King Lumber, which operated the facility as a saw mill, lumber yard, and wood treating operation from 1928 to 1964 (Refs. 7; 8, pp. 1, 5; 69). King Lumber also owned the railroad that runs along the northern bank of Batchelor Creek, north of the SWP property. There has been visual observation of creosote contamination along the northern bank of Batchelor Creek, which may be a result of King Lumber operations (Ref. 44, p. 43). Because King Lumber's operations included wood treating, site operations and the types of hazardous substances (SVOCs) used are expected to be similar (Refs. 7; 8, p. 5). In addition, King Lumber constructed a mill pond north of the SWP property to store its lumber. This pond is currently being operated by CMU as a wastewater treatment pond (Ref. 69). Several residential properties located along the southern side of Covington Drive were reportedly located within the original footprint of King Lumber. Soil samples collected at these properties during the September 2008 EPA ESI contained site-related contaminants, including anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, naphthalene, pentachlorophenol, phenanthrene, and pyrene (Ref. 5, pp. 18, 19; 5, Appendix A, p. A-4, Appendix B, pp. B-51, B-52, B-53). Specific details of operations, waste management, and disposal procedures employed by King Lumber are not known.

4.0 SURFACE WATER MIGRATION PATHWAY

4.1 OVERLAND/FLOOD MIGRATION COMPONENT – Batchelor Creek

4.1.1.1 Definition of Hazardous Substance Migration Path for Overland/Flood Component

The hazardous substance migration pathway includes both the overland segment and the in-water segment that hazardous substances would take as they migrate away from sources. The overland segment begins at the source and proceeds downgradient to the probable point of entry (PPE) to surface water. The in-water segment at the PPE continues in the direction of flow (Ref. 1, Section 4.1.1.1).

Overland flow from Source Nos. 1 and 2 (the stockpile and contaminated soil on the SWP property, respectively) generally follows land topography, which slopes north toward Batchelor Creek (Ref. 62). The southern portion of the SWP property has an elevation of 240 feet above mean sea level and the elevation of Batchelor Creek is 230 feet above mean sea level (see Figure 1 of this HRS documentation record). EPA constructed a slurry wall measuring 1,500 feet long, three feet wide, and 30 feet below land surface between the SWP property and the southern bank of Batchelor Creek to prevent further migration of hazardous substances to Batchelor Creek (Refs. 70; 73, p. 6; 75, pp. 4, 5) (see Figure 2 of this HRS documentation record). It did not, however, include the construction of any run-on control or runoff management features (Refs. 62; 75, p. 3)

PPE 1 may be delineated by the downgradient intersection of the overland path with Batchelor Creek between sample stations SWP14 and SWP02. PPE 1 covers 2,370 feet along the northern boundary of the SWP property, which is Batchelor Creek (Refs. 4; 54; 77) (see Figure 3 of this HRS documentation record). The 15-mile target distance limit (TDL) of the surface water migration pathway begins at the most downstream point of PPE 1 (Refs. 4; 54). Batchelor Creek flows to the northwest approximately 8.5 miles before it merges with Bear Creek, which continues in a northwest direction for about 4.25 miles to the Big Black River. Flow continues in the Big Black River for the remainder of the 15-mile surface water migration pathway TDL near Ross Lake in Yazoo County, Mississippi (Ref. 4). According to the U.S. Geological Survey (USGS), the average annual flow rate for the Big Black River is approximately 6,079 cubic feet per second (cfs) (Ref. 35). USGS flow rate data are not available for Batchelor Creek or Bear Creek. Water level observations made during the EPA time-critical removal action September 2009 to March 2010 indicate that the flow rate for Batchelor Creek is estimated to be from 0.13 to 22 cfs. Batchelor Creek is prone to flooding during rain events (Refs. 7, p. i; 50, p. 1; 59; 60).

4.1.2.1 LIKELIHOOD OF RELEASE

4.1.2.1.1 OBSERVED RELEASE – Direct Observation

During the 1970s, the SWP facility received several notices of violation and fines from the Mississippi Pollution Control Commission (currently the Mississippi Office of Pollution Control) for gross contamination of the process area; releases of hazardous substances to Batchelor Creek; and inadequate treatment of process wastewater before it was discharged into the city sewage treatment facility (Ref. 10, pp. 1, 2). Before 1977, when the Clean Water Act was enacted, the facility reportedly discharged approximately 50,000 gallons of wastewater per day directly into Batchelor Creek, which flows through a city park, a residential area, and downtown Canton before it enters Bear Creek (Refs. 11, p. 1; 15, p. 1). The State of Mississippi received complaints of children, who had been playing in Batchelor Creek near the city park, suffering from creosote burns (Ref. 14, p. 4).

In 1988, SCS designed a soil erosion prevention plan that included excavating and widening Batchelor Creek. While surveying the creek, SCS personnel observed oily waste leaching into the creek from the SWP property. In response, EPA removed contaminated soil from the creek bank observed to be leaching contaminants into Batchelor Creek to facilitate the SCS stream widening project (Ref. 14, p. 3). EPA also installed a geofabric liner in the bed of the creek, and the banks were lined with rip-rap to prevent erosion (Ref. 9, p. 4). As a result of this stream widening project, Batchelor Creek adjacent to the SWP property moved from a 5-year flood plain to a 10-year flood. Also, each time the SWP property floods, contaminated soil washes into Batchelor Creek (Ref. 14, pp. 3, 4).

During the EPA RSE conducted in February 2008, creosote was observed in Batchelor Creek downstream of Source No. 1, specifically at sediment sampling location SWP-SD-01 (Ref. 19, pp. 1, 2; 19, Appendix C, p. 5). During the September 2008 EPA ESI sampling event, creosote was observed in Batchelor Creek adjacent to and downstream from Source Nos. 1 and 2 (Ref. 5, p. 1; 5, Appendix A, Figure 4, p. A-4; 5, Appendix C, Logbook 2, pp. 3, 4; 5, Appendix D, pp. D-8, D-9, D-13). MDEQ personnel have observed creosote emanating from the SWP property into Batchelor Creek, as well as along the 15-mile surface water TDL as far as the Big Black River, approximately 12.5 miles downstream of the SWP property (Ref. 7, pp. i, 2).

From August 2009 to November 2010, EPA conducted a time-critical removal action at the SWP property under CERCLA (Refs. 44, p. 1; 75, p. 1). Because of the extensive creosote contamination in Batchelor Creek, EPA excavated between 1,500 and 1,800 linear feet of Batchelor Creek adjacent to the SWP property at depths ranging from 5 to 15 feet below the creek bed (Refs. 44, p. 1; 62; 70; 78) (see Figure 2 of this HRS documentation record). During excavation, free-phase creosote was observed in the creek bed and emanating from the creek bank adjacent to the SWP property (Refs. 7, p. 2; 44, p. 6). Coal tar creosote, or creosote, consists of aromatic hydrocarbons, anthracene, naphthalene, and phenanthrene derivatives. At least 75% of the creosote mixture is comprised of PAHs (Ref. 66, pp. 220, 223).

4.1.2.1.1 OBSERVED RELEASE – Chemical Analysis

EPA September 2008 Expanded Site Inspection

Background Samples

During the EPA September 2008 ESI, a background sediment sample (SWP-SD-01) was collected from Batchelor Creek upstream of SWP sources to attribute potential contaminants detected in samples downstream of runoff from the property. Background sediment samples were also collected from tributaries of Batchelor Creek to evaluate whether other possible off-site sources are affecting Batchelor Creek (Ref. 5, Appendix A, Figure 4, p. A-4). Results for background sediment samples SWP-SD-01 (Batchelor Creek), SWP-SD-12 (Tributary 1), SWP-SD-14 (Tributary 3), SWP-SD-14-DUP (Tributary 3), and SWP-SD-15 (Tributary 4) were compared with sediment samples collected from Batchelor Creek adjacent to and downstream from Source Nos. 1 and 2. Specifically, results for background sediment samples SWP-SD-01, SWP-SD-12, SWP-SD-14, and SWP-SD-14-DUP were compared with sediment samples collected from Batchelor Creek adjacent to and downstream from Source Nos. 1 and 2, but upstream of Tributary 4. Sediment samples collected from Batchelor Creek downstream of Tributary 4 were also compared with the background Tributary 4 sample SWP-SD-15 (Ref. 54).

The background sediment samples (except SWP-SD-15) were found to contain varying levels of SVOCs. In particular, the two sediment samples (SWP-SD-14 and SWP-SD-14-DUP) that were collected from unnamed Tributary 3, north of the SWP property, contained levels of SVOCs up to 1,500 µg/kg (Ref. 5, Appendix A, Figure 4, p. A-4; 5, Appendix B, Table 5, pp. B-7, B-8). Tributary 3 sediment samples were collected about 100 feet upstream of its confluence with Batchelor Creek and within the historical boundary of the original owner of the SWP property, King Lumber (Ref. 5, Appendix A, Figure 3, p. A-3, Figure 4, p. A-4). Therefore, the contaminant concentrations in these background samples may be attributable to the wood treating operations. However, as shown in the following tables, when conservatively using Tributary 3 samples to establish background levels, levels of SVOCs in sediment samples collected downstream of the PPE for Source Nos. 1 and 2 nonetheless contained SVOCs at levels meeting observed release criteria.

A background sediment sample was not collected from Batchelor Creek during the EPA February 2008 RSE; therefore, downstream sediment samples collected from Batchelor Creek during the EPA February 2008 RSE were compared with background sediment samples collected during the EPA September 2008 ESI. Samples collected during both investigations were collected using similar sampling procedures, at similar depths, and from similar areas within the creek (Refs. 5, pp. 7, 8; 5, Appendix C, Logbook 2, p. 1; 19, p. 3; 19, Appendix C, p. C-2; 26, pp. 1, 3; 36; 63).

Background sediment samples were collected in accordance with the EPA Region 4 SESD Field Branch Quality System and Technical Procedures for Sediment Sampling, SESDPROC-200-R1 (Ref. 36). Sediment samples were collected from depositional areas at depths ranging from 0 to 3 inches bgs along the banks of Batchelor Creek and the unnamed tributaries. The locations of the background sediment samples are depicted in Reference 5, Appendix A, Figure 4, page A-4 and are listed in Reference 5, Appendix B, Table 5, pages B-7 and B-8. Chain-of-custody records are provided in Reference 20. Logbook notes are provided in Reference 5, Appendix C.

TABLE 8: Background Sediment Samples – September 2008

Station ID	Sample ID	Sample Location	Depth (inches bgs)	Date Sampled	References
Batchelor Creek					
SWPBC01	SWP-SD-01	1,404 feet upstream of eastern-most point of PPE 1	0 to 3	09/23/2008	5, Appendix A, Figure 4, p. A-4; 5, Appendix B, p. B-7; 5, Appendix C, Logbook

TABLE 8: Background Sediment Samples – September 2008					
Station ID	**Sample ID**	**Sample Location**	**Depth (inches bgs)**	**Date Sampled**	**References**
					2, p. 5; 20, p. 4; 54; 77
Tributary 1					
SWPT01	SWP-SD-12	274 feet upstream of confluence with Batchelor Creek	0 to 3	09/24/2008	5, Appendix A, Figure 4, p. A-4; 5, Appendix B, p. B-7; 5, Appendix C, Logbook 2, p. 6; 20, p. 7; 54; 77
Tributary 3					
SWPT03	SWP-SD-14	140 feet upstream of confluence with Batchelor Creek	0 to 3	09/23/2008	5, Appendix A, Figure 4, p. A-4; 5, Appendix B, p. B-8; 5, Appendix C, Logbook 2, p. 4; 20, p. 4; 54; 77
	SWP-SD-14-DUP				
Tributary 4					
SWPT04	SWP-SD-15	83 feet upstream of confluence with Batchelor Creek	0 to 3	09/23/2008	5, Appendix A, Figure 4, p. A-4; 5, Appendix B, p. B-8; 5, Appendix C, Logbook 2, p. 3; 20, p. 2; 54; 77

Notes:

BC Batchelor Creek
bgs Below ground surface
DUP Duplicate
ID Identification number
SD Sediment sample
SWP Southeastern Wood Preserving
T Tributary

Background Concentrations

The sediment samples listed in Table 9 were collected during the EPA September 2008 ESI (Refs. 5, Appendix C, Logbook 2, pp. 3, 5, 6; 20, pp. 2, 4, 7). All sediment samples were analyzed under the EPA CLP for SVOCs in accordance with the EPA CLP SOW SOM01.2 (Refs. 5, p. 8; 5, Appendix E, pp. E-1, E-2; 21, Appendix B, Table 7, p. B-10; 21, Appendix C, p. C-12; 55). EPA Region 4 SESD reviewed all data according to the contract SOW and EPA guidelines (Ref. 5, Appendix E, p. E-2; 42). The MRLs are listed on the analytical data sheets in Reference 5, Appendix E. Each MRL is sample-specific and corresponds to the lowest quantitative point on the calibration curve; it is adjusted for the amount of sample prepared and any dilutions performed, as well as for percent moisture. The MRLs are equivalent to SQLs (Ref. 23). The analytical data sheets are provided in Reference 5, Appendix E.

TABLE 9: Analytical Results for Background Sediment Samples – September 2008

Sample ID	Hazardous Substance	Hazardous Substance Concentration	MRL	References
Batchelor Creek				
SWP-SD-01	Anthracene	6.3 µg/kg	4.6 µg/kg	5, Appendix C, Logbook 2, p. 5; 5, Appendix E, p. E-121; 20, p. 4
SWP-SD-01	Benzo(a)anthracene	40 µg/kg	23 µg/kg	5, Appendix C, Logbook 2, p. 5; 5, Appendix E, p. E-121; 20, p. 4
SWP-SD-01	Chrysene	60 µg/kg	23 µg/kg	5, Appendix C, Logbook 2, p. 5; 5, Appendix E, p. E-121; 20, p. 4
SWP-SD-01	Dibenzofuran	240U µg/kg	240 µg/kg	5, Appendix C, Logbook 2, p. 5; 5, Appendix E, p. E-121; 20, p. 4
SWP-SD-01	Naphthalene	2.6J (26) µg/kg	4.6 µg/kg	5, Appendix C, Logbook 2, p. 5; 5, Appendix E, p. E-122; 20, p. 4; 39, pp. 8, 15; 41, pp. i, 3
SWP-SD-01	Phenanthrene	19 µg/kg	4.6 µg/kg	5, Appendix C, Logbook 2, p. 5; 5, Appendix E, p. E-122; 20, p. 4
SWP-SD-01	Pyrene	150 µg/kg	23 µg/kg	5, Appendix C, Logbook 2, p. 5; 5, Appendix E, p. E-122; 20, p. 4
Tributary 1				
SWP-SD-12	Anthracene	130U µg/kg	130 µg/kg	5, Appendix C, Logbook 2, p. 6; 5, Appendix E, p. E-229; 20, p. 7
SWP-SD-12	Benzo(a)anthracene	130U µg/kg	130 µg/kg	5, Appendix C, Logbook 2, p. 6; 5, Appendix E, p. E-229; 20, p. 7
SWP-SD-12	Chrysene	70J (700) µg/kg	130 µg/kg	5, Appendix C, Logbook 2, p. 6; 5, Appendix E, p. E-229; 20, p. 7; 39, pp. 8, 14; 41, pp. i, 3
SWP-SD-12	Dibenzofuran	3,300U µg/kg	3,300 µg/kg	5, Appendix C, Logbook 2, p. 6; 5, Appendix E, p. E-229; 20, p. 7
SWP-SD-12	Naphthalene	150 µg/kg	130 µg/kg	5, Appendix C, Logbook 2, p. 6; 5, Appendix E, p. E-230; 20, p. 7
SWP-SD-12	Phenanthrene	150 µg/kg	130 µg/kg	5, Appendix C, Logbook 2, p. 6; 5, Appendix E, p. E-230; 20, p. 7

TABLE 9: Analytical Results for Background Sediment Samples – September 2008				
Sample ID	**Hazardous Substance**	**Hazardous Substance Concentration**	**MRL**	**References**
SWP-SD-12	Pyrene	110J (1,304.6) µg/kg	130 µg/kg	5, Appendix C, Logbook 2, p. 6; 5, Appendix E, p. E-230; 20, p. 7; 39, pp. 8, 15; 41, pp. i, 3
Tributary 3				
SWP-SD-14	Anthracene	99U µg/kg	99 µg/kg	5, Appendix C, Logbook 2, p. 4; 5, Appendix E, p. E-235; 20, p. 4
SWP-SD-14	Benzo(a)anthracene	460 µg/kg	99 µg/kg	5, Appendix C, Logbook 2, p. 4; 5, Appendix E, p. E-235; 20, p. 4
SWP-SD-14	Chrysene	430 µg/kg	99 µg/kg	5, Appendix C, Logbook 2, p. 4; 5, Appendix E, p. E-235; 20, p. 4
SWP-SD-14	Dibenzofuran	2,500U µg/kg	2,500 µg/kg	5, Appendix C, Logbook 2, p. 4; 5, Appendix E, p. E-235; 20, p. 4
SWP-SD-14	Naphthalene	57J (570) µg/kg	99 µg/kg	5, Appendix C, Logbook 2, p. 4; 5, Appendix E, p. E-236; 20, p. 4; 39, pp. 8, 15; 41, pp. i, 3
SWP-SD-14	Phenanthrene	99U µg/kg	99 µg/kg	5, Appendix C, Logbook 2, p. 4; 5, Appendix E, p. E-236; 20, p. 4
SWP-SD-14	Pyrene	490 µg/kg	99 µg/kg	5, Appendix C, Logbook 2, p. 4; 5, Appendix E, p. E-236; 20, p. 4
SWP-SD-14-DUP	Anthracene	190 µg/kg	130 µg/kg	5, Appendix C, Logbook 2, p. 4; 5, Appendix E, p. E-238; 20, p. 4
SWP-SD-14-DUP	Benzo(a)anthracene	1,500 µg/kg	260 µg/kg	5, Appendix C, Logbook 2, p. 4; 5, Appendix E, p. E-238; 20, p. 4
SWP-SD-14-DUP	Chrysene	1,500 µg/kg	260 µg/kg	5, Appendix C, Logbook 2, p. 4; 5, Appendix E, p. E-238; 20, p. 4
SWP-SD-14-DUP	Dibenzofuran	3,300U µg/kg	3,300 µg/kg	5, Appendix C, Logbook 2, p. 4; 5, Appendix E, p. E-238; 20, p. 4
SWP-SD-14-DUP	Naphthalene	88J (880) µg/kg	130 µg/kg	5, Appendix C, Logbook 2, p. 4; 5, Appendix E, p. E-239; 20, p. 4; 39, pp. 8, 15; 41, pp. i, 3
SWP-SD-14-DUP	Phenanthrene	120J (1,200) µg/kg	130 µg/kg	5, Appendix C, Logbook 2, p. 4; 5, Appendix E, p. E-239; 20, p. 4; 39, pp. 8, 15; 41, pp. i, 4
SWP-SD-14-DUP	Pyrene	690 µg/kg	130 µg/kg	5, Appendix C, Logbook 2, p. 4; 5, Appendix E, p. E-239; 20, p. 4
Tributary 4				
SWP-SD-15	Anthracene	130U µg/kg	130 µg/kg	5, Appendix C, Logbook 2, p. 3; 5, Appendix E, p. E-244; 20, p. 2
SWP-SD-15	Naphthalene	130U µg/kg	130 µg/kg	5, Appendix C, Logbook 2, p. 3; 5, Appendix E, p. E-245; 20, p. 2

Notes:

( )	Concentrations shown in parentheses were adjusted in accordance with References 39, 40, and 41.
DUP	Duplicate
ID	Identification number
J	The identification of the analyte is acceptable; the reported value is an estimate.
µg/kg	Microgram per kilogram
MRL	Minimum reporting limit
SD	Sediment sample
SWP	Southeastern Wood Preserving
U	The analyte was not detected at or above the minimum reporting limit.

Contaminated Samples

Sediment samples listed in Table 10 were collected along Batchelor Creek during the EPA February 2008 RSE and the EPA September 2008 ESI. Five sediment samples were collected along Batchelor Creek downstream of Source Nos. 1 and 2 (Refs. 5, Appendix A, Figure 4, p. A-4; 19, Appendix A, Figure 2, p. A-2). Sediment samples were collected from depositional areas at depths ranging from 0 to 6 inches bgs (Refs. 5, Appendix C, Logbook 2, pp. 2, 3, 4; 19, Appendix C, pp. 4, 5; 20, p. 2; 21, p. 8; 45, p. 332). The February 2008 samples were collected in accordance with the EPA SESD Environmental Investigations Standard Operating Procedures and Quality Assurance Manual, November 2001 (Ref. 19, p. 2; 63). The September 2008 samples were collected in accordance with the EPA Region 4 SESD Field Branch Quality System and Technical Procedures for Sediment Sampling, SESDPROC-200-R1 (Ref. 36). Logbook notes for the EPA February 2008 RSE are provided in Reference 19, Appendix C and logbook notes for the EPA September 2008 ESI are provided in Reference 5, Appendix C. The chain-of-custody record for samples collected during the EPA February 2008 RSE are provided in Reference 45 and the chain-of-custody records for samples collected during the EPA September 2008 ESI are provided in Reference 20. The locations of the downstream sediment samples are depicted in Reference 5, Appendix A, Figure 4, page A-4 and in Reference 19, Appendix A, Figure 2, page A-2.

All of the observed release sediment samples presented below were collected downstream of the area addressed by the EPA removal action in Batchelor Creek (Refs. 5, Appendix A, Figure 4, p. A-4; 19, Appendix A, Figure 2, p. A-2; 67, pp. 1, 2, 3) (See also Figure 2 of this HRS documentation record).

TABLE 10: Sediment Samples – February and September 2008

Station ID	Sample ID	Sample Location	Distance from PPE	Depth (in. bgs)	Date Sampled	References
February 2008 Sample						
NA	SWP-SD-02	Batchelor Creek, east of the intersection of Miller Street and Batchelor Creek	741 feet downstream of western-most point of PPE 1	0 to 6	02/28/2008	19, Appendix A, Figure A-2; 19, Appendix B, Table 1, p. B-1; 19, Appendix C, p. 5; 45, p. 332; 54; 77
September 2008 Samples						
SWPBC05	SWP-SD-05	Batchelor Creek, at the confluence of the ditch located southwest of the historical SWP property boundary	715 feet of western-most point of PPE 1	0 to 6	09/23/2008	5, Appendix A, Figure 4, p. A-4; 5, Appendix B, Table 5, pp. B-7, B-8; 5, Appendix C, Logbook 2, p. 3; 20, p. 2; 54; 77
SWPBC06	SWP-SD-06	Batchelor Creek, downstream of SWP property and east of U.S. Highway 51	3,149 feet downstream of western-most point of PPE 1	0 to 3	09/22/2008	5, Appendix A, Figure 4, p. A-4; 5, Appendix B, Table 5, pp. B-7, B-8; 5, Appendix C, Logbook 2, p. 2; 20, p. 2; 54; 77

TABLE 10: Sediment Samples – February and September 2008						
Station ID	**Sample ID**	**Sample Location**	**Distance from PPE**	**Depth (in. bgs)**	**Date Sampled**	**References**
SWPBC11	SWP-SD-11	Batchelor Creek, downstream of SWP property	1.79 miles downstream of western-most point of PPE 1	0 to 3	09/22/2008	5, Appendix A, Figure 4, p. A-4; 5, Appendix B, Table 5, pp. B-7, B-8; 5, Appendix C, Logbook 2, p. 2; 20, p. 2; 54; 77

Notes:

BC	Batchelor Creek
bgs	Below ground surface
ID	Identification
in.	Inches
NA	No Station ID assigned
PPE	Probable point of entry
SD	Sediment sample
SWP	Southeastern Wood Preserving

Contaminated Concentrations

The sediment samples listed in Table 11 were collected during the EPA February 2008 RSE and the EPA September 2008 ESI sampling events (Refs. 5, Appendix C, Logbook 2, pp. 2, 3, 4; 19, Appendix C, pp. 4, 5; 20, p. 2; 45, p. 332).

Sediment samples collected during the EPA February 2008 RSE were analyzed by Pace Analytical Services, Inc., for SVOCs in accordance with SW-846 Method 8270C (Refs. 19, Appendix D, p. D-15; 45, pp. 14, 15, 16, 19; 57). Tetra Tech reviewed all data according to the National Functional Guidelines for Superfund Organic Methods Data Review (Ref. 19, Appendix D, p. D-15). The data validation report is provided in Reference 19, Appendix D. The RLs are listed on the analytical data sheets in Reference 45. Each RL is sample-specific and corresponds to the lowest quantitative point on the calibration curve; it is adjusted for the amount of sample prepared and any dilutions performed, as well as for percent moisture. The RLs are equivalent to SQLs (Ref. 49). The analytical data sheets are provided in Reference 45.

Sediment samples collected during the EPA September 2008 ESI were analyzed under the EPA CLP for SVOCs in accordance with the CLP SOW SOM01.2 (Refs. 5, p. 8, Appendix E, pp. E-1, E-2; 21, Appendix B, Table 7, p. B-10; 21, Appendix C, p. C-12; 55). EPA Region 4 SESD reviewed all data according to the National Functional Guidelines for Superfund Organic Methods Data Review, as well as the contract SOW and EPA guidelines (Ref. 5, Appendix E, p. E-2; 42). The MRLs are listed on the analytical data sheets in Reference 5, Appendix E. Each MRL is sample-specific and corresponds to the lowest quantitative point on the calibration curve; it is adjusted for the amount of sample prepared and any dilutions performed, as well as for percent moisture. The MRLs are equivalent to SQLs (Ref. 23). The analytical data sheets are provided in Reference 5, Appendix E.

TABLE 11: Analytical Results for Sediment Samples – February and September 2008

Sample ID	Hazardous Substance	Hazardous Substance Concentration	MRL/RL*	References
Samples Compared to Batchelor Creek, Tributary 1, and Tributary 3 Samples				
February 2008 Sediment Samples				
SWP-SD-02	Phenanthrene	14,100 µg/kg	2,520 µg/kg	19, Appendix C, p. 5; 45, pp. 19, 332
SWP-SD-02	Pyrene	6,350 µg/kg	2,520 µg/kg	19, Appendix C, p. 5; 45, pp. 19, 332
September 2008 Sediment Samples				
SWP-SD-05	Phenanthrene	10,000 µg/kg	3,100 µg/kg	5, Appendix C, Logbook 2, p. 3; 5, Appendix E, p. E-140; 20, p. 2
SWP-SD-05	Pyrene	7,000 µg/kg	2,400 µg/kg	5, Appendix C, Logbook 2, p. 3; 5, Appendix E, p. E-140; 20, p. 2
Samples Compared to Batchelor Creek, Tributary 1, Tributary 3, and Tributary 4 Samples				
September 2008 Sediment Samples				
SWP-SD-06	Anthracene	1,100 µg/kg	220 µg/kg	5, Appendix C, Logbook 2, p. 2; 5, Appendix E, p. E-148; 20, p. 2
SWP-SD-11	Anthracene	650 µg/kg	180 µg/kg	5, Appendix C, Logbook 2, p. 2; 5, Appendix E, p. E-169; 20, p. 2

TABLE 11: Analytical Results for Sediment Samples – February and September 2008				
Sample ID	**Hazardous Substance**	**Hazardous Substance Concentration**	**MRL/RL***	**References**
SWP-SD-11	Naphthalene	6,300 µg/kg	4,600 µg/kg	5, Appendix C, Logbook 2, p. 2; 5, Appendix E, p. E-170; 20, p. 2

Notes:

*	The February 2008 RLs are equivalent to sample quantitation limits (Ref. 49).
ID	Identification number
µg/kg	Microgram per kilogram
MRL	Minimum reporting limit
SD	Sediment sample
RL	Reporting limit
SWP	Southeastern Wood Preserving

Additional Supporting Data

During the EPA February 2008 RSE, two sediment samples (SWP-SD-01 and SWP-SD-02) were collected from Batchelor Creek 0 feet and 700 feet downstream from PPE 1, respectively. These samples were analyzed for dioxins and furans in addition to SVOCs (Ref. 19, p. 2; 19, Appendix A, Figure 2, p. A-2; 19, Appendix B, Table 4, pp. B-4, B-5). Dioxins and furans detected in these samples could not be evaluated as observed releases because the background sediment sample was not analyzed for dioxins and furans. Sediment sample SWP-SD-01 contained 1,2,3,4,6,7,8-HpCDD (650 ng/kg); 1,2,3,4,6,7,8-HpCDF (380 ng/kg); and 1,2,3,6,7,8-HxCDD (25 ng/kg). Sediment sample SWP-SD-02 contained 1,2,3,4,6,7,8-HpCDD (350 ng/kg); 1,2,3,4,6,7,8-HpCDF (200 ng/kg); and 1,2,3,6,7,8-HxCDD (11 ng/kg) (Ref. 46, pp. 41, 42).

During the EPA September 2008 ESI, one sediment sample (SWP-SD-08) was collected from Batchelor Creek, about 3,700 feet downstream from PPE 1, at a depth of 12 to 14 inches bgs (Refs. 5, Appendix A, Figure 4, p. A-4; 5, Appendix B, Table 5, pp. B-7, B-8; 5, Appendix C, Logbook 2, p. 2; 54). A background sample at a similar depth was not collected (Ref. 5, Appendix B, Table 5, pp. B-7, B-8). This sample was collected from a depositional area immediately west of the Union Street bridge over Batchelor Creek within Saab Park (Ref. 5, Appendix A, Figure 4, p. A-4). The following hazardous substances were detected in sediment sample SWP-SD-08: anthracene (1,100 µg/kg), benzo(a)pyrene (3,700 µg/kg), benzo(k)fluoranthene (3,800 µg/kg), and pyrene (3,300 µg/kg) (Ref. 5, Appendix B, Table 23, pp. B-48, B-49, B-50).

The current SWP property was originally part of a larger property owned by King Lumber, which operated the facility as a saw mill, lumber yard, and wood treating operation from 1928 to 1964 (Refs. 7; 8, pp. 1, 5; 69). King Lumber also owned the railroad that runs along the northern bank of Batchelor Creek, north of the SWP property where Tributary 3 background sediment samples SWP-SD-14 and SWP-SD-14-DUP were collected (Refs. 5, Appendix A, Figure 4, p. A-4; 69). SVOCs were also detected in sediment samples SWP-SD-07, SWP-SD-09, and SWP-SD-10, downstream of Tributary 3 and the PPE. Sediment samples SWP-SD-07, SWP-SD-09, and SWP-SD-10 contained anthracene ranging from 200 µg/kg to 440 µg/kg, benzo(a)anthracene ranging from 530 µg/kg to 1,500 µg/kg, benzo(a)pyrene ranging from 370 µg/kg to 810 µg/kg, benzo(k)fluoranthene ranging from 340 µg/kg to 820 µg/kg, chrysene ranging from 740 µg/kg to 2,000 µg/kg, indeno(1,2,3-cd)pyrene ranging from 290 µg/kg to 530 µg/kg, phenanthrene ranging from 160 µg/kg to 540 µg/kg, and pyrene ranging from 610 µg/kg to 1,400 µg/kg (Ref. 5, Appendix A, Figure 4, p. A-4; 5, Appendix B, Table 5, pp. B-7, B-8; 5, Appendix E, pp. E-154, E-155, E-163, E-164, E-166, E-167).

From August 2009 to November 2010, EPA conducted a time-critical removal action at the SWP property under CERCLA (Refs. 44, p. 1; 75, p. 1). Because of the extensive creosote contamination in Batchelor Creek, EPA excavated between 1,500 and 1,800 linear feet of Batchelor Creek adjacent to the SWP property (Refs. 44, p. 1; 62; 70; 78) (see Figure 2 of this HRS documentation record). One sediment sample was collected from this location prior to the removal during the February 2008 RSE, and one sediment sample was collected from this area, also prior to the removal, during the September 2008 ESI. Table 12 summarizes the hazardous substances detected in these samples.

TABLE 12: Summary of Samples Collected from the Batchelor Creek Removal Area				
Station ID	**Sample ID**	**Sample Location**	**Hazardous Substances**	**References**
February 2008 Sample				
NA	SWP-SD-01	Batchelor Creek, 150 feet north west of the northwestern corner of Source No. 1	Dibenzofuran, naphthalene, phenanthrene, pyrene	19, Appendix C, p. 4; 45, pp. 14, 15, 16, 332; 54
September 2008 Sample				
SWPBC04	SWP-SD-04	Batchelor Creek, west of the stockpile, within boundary of PPE 1	Anthracene, benzo(a) anthracene, chrysene, dibenzofuran, naphthalene, phenanthrene, pyrene	5, Appendix A, p. A-4; 5, Appendix B, pp. B-7, B-8; 5, Appendix E, p. E-136; 20, p. 2; 54

Notes:

BC Batchelor Creek
ID Identification
NA Not applicable
PPE Probable point of entry
SD Sediment
SWP Southeastern Wood Preserving

Attribution

The current SWP property was originally part of a larger property owned by King Lumber, which operated the facility as a saw mill, lumber yard, and wood treating operation beginning in 1928 (Refs. 7, p. i; 8, p. 1). During former operations, southern yellow pine timbers were stripped of bark and placed in retort cylinders for drying. Wood preservatives, creosote or PCP, were pumped into the cylinders (Refs. 10, p. 2; 11, p. 1; 12, p. 1). Coal tar creosote, or creosote, consists of aromatic hydrocarbons, anthracene, naphthalene, and phenanthrene derivatives. At least 75% of the creosote mixture is comprised of PAHs (Ref. 66, pp. 220, 223). The cylinders were pressurized to force the liquid into the wood until it was saturated. The wood was then removed to drip dry, and the residual liquid was drained (Refs. 10, p. 2; 11, p. 1). King Lumber also constructed a mill pond on the northern bank of Batchelor Creek to store lumber. This pond is now owned and operated by CMU as a wastewater treatment pond (Ref. 69).

During the 1970s, the facility received several notices of violation and fines from the Mississippi Office of Pollution Control for gross contamination of the process area; releases of hazardous substances to Batchelor Creek; and inadequate treatment of process wastewater before being discharged into the city sewage treatment facility (Ref. 10, pp. 1, 2). Before 1977, the facility reportedly discharged approximately 50,000 gallons of wastewater per day directly into Batchelor Creek, which flows through a city park, a residential area, and downtown Canton before it enters Bear Creek (Refs. 11, p. 1; 15, p. 1). The State of Mississippi received complaints of children suffering from creosote burns who had been playing in Batchelor Creek near the city park (Ref. 14, p. 4). When operations ceased in 1979, the property contained large areas of contamination in the treatment and storage areas, piles of contaminated soil, creosote sludge storage tanks, and three unlined wastewater surface impoundments that reportedly had been filled by a previous owner at an unspecified time (Ref. 9, p. 1).

In 1986, EPA initiated an emergency response action at the SWP property to stabilize the three unlined surface impoundments that contained creosote sludge and water. The impoundments were excavated, and the contaminated sludge was stabilized with lime kiln dust (Ref. 14, p. 2). Lime kiln dust, or cement kiln dust, can contain various metals and dioxins and furans (Ref. 65, pp. 12, 13). According to a risk assessment study conducted by the Research Triangle Institute on behalf of EPA, the concentrations of dioxins and furans detected in the sampled cement kiln dust are generally well below the concentrations of dioxins and furans scored in this HRS documentation record, some being orders of magnitude below (Refs. 5, Appendix B, Table 14, pp. B-29, B-30, B-31; 19, Table 4, pp. B-4, B-5; 65, pp. 1, 11, 12, 13; see also Tables 2 and 5 of this HRS documentation record). Bottom sediment sludge from the impoundments contained total PAHs at a concentration of 3,815 mg/kg and was, therefore, classified as a RCRA K001-listed hazardous waste (Ref. 51, pp. i, 2). Approximately 8,000 cubic yards, or 12,000 tons, of stabilized sludge were then stockpiled on the property to await treatment or disposal at a later date (Ref. 14, pp. 2, 3, 5). Also in 1986, an EPA Emergency Response and Cleanup Services contractor dismantled the creosote sludge storage tanks (Ref. 9, p. 4). It is not known where these tanks were located on the property or how they were disposed. However, they are no longer present on the property (Ref. 68). In 1988, SCS designed a soil erosion prevention plan that included excavating and widening Batchelor Creek. While surveying the creek, SCS personnel observed oily waste leaching into the creek from the SWP property. In response, EPA removed contaminated soil from the creek bank observed to be leaching contaminants into Batchelor Creek to facilitate the SCS stream widening project (Ref. 14, p. 3). EPA also installed a geofabric liner in the bed of the creek, and the banks were lined with rip-rap to prevent erosion (Ref. 9, p. 4).

From 1991 to 1994, EPA treated the stockpiled material from the surface impoundments using biotreatment (Ref. 16, pp. 1, 2). A treatability variance was approved after several failed attempts to reach land disposal restriction standards for wood preserving waste (K001), specifically with respect to phenanthrene and pyrene, which both have a K001 cleanup standard of 1.5 mg/kg (Refs. 16, pp. 1, 2; 43, pp. 3, 4, 7). The cleanup standards were modified to be based on total PAH concentrations instead of individual PAH analyte K001 treatment standards (Ref. 51, p. 7). Samples collected from Source Nos. 1 and 2 during the EPA September 2008 ESI contained elevated concentrations of SVOCs, including anthracene, benzo(a)anthracene, chrysene, dibenzofuran, naphthalene, phenanthrene and pyrene.

Analytical results of samples collected from Batchelor Creek, which receives runoff from Source Nos. 1 and 2, also contained elevated concentrations of SVOCs, including anthracene, naphthalene, phenanthrene and pyrene (Refs. 5, Appendix E; 69) (see Sections 2.0 and 3.0 of this HRS documentation record). Anthracene was detected at concentrations as high as 4,830 µg/kg (SWP-WS-03) in Source No. 1 and 970,000 µg/kg (SWP-SB-09C) in Source No. 2. Benzo(a)anthracene was detected at concentrations as high as 459 µg/kg (SWP-WS-02) in Source No. 1 and 66,000 µg/kg (SWP- SB-10B) in Source No. 2. Chrysene was detected at concentrations as high as 3,760 µg/kg (SWP-WS-03) in Source No. 1 and 100,000 µg/kg (SWP-SB-10B) in Source No. 2. Dibenzofuran was detected at concentrations as high as 1,600,000J µg/kg (SWP-SB-09C) in Source No. 2. Naphthalene was detected as high as 883 µg/kg (SWP-WS-02) in Source No. 1. Phenanthrene was detected at concentrations as high as 1,110 µg/kg (SWP-WS-02D) in Source No. 1 and at concentrations as high as 5,600,000 µg/kg (SWP-SB-09C) in Source No. 2. Pyrene was detected at concentrations as high as 3,090 µg/kg (SWP-WS-03) in Source No. 1 and at concentrations as high as 1,800,000 µg/kg (SWP-SB-09C) in Source No. 2 (Refs. 5, Appendix E, p. E-62; 45, p. 13) (see Tables 2 and 5 of this HRS documentation record). The highest concentrations of phenanthrene and pyrene were detected in sample SWP-SB-09C, located at the northwestern corner of the stockpile (Source No. 1) at a depth of 8 to 12 feet bgs (Refs. 5, Appendix A, Figure 4, p. A-4; 5, Appendix E, p. E-62; 18, p. 4; 47, Enclosure 2, pp. E-27, E-28) (see Figure 3 of this HRS documentation record). Phenanthrene and pyrene were also detected at elevated concentrations (1,500,000 µg/kg phenanthrene and 400,000 µg/kg pyrene) in the deepest sample (SWP-SB-11E) collected from Source No. 2 (16 to 20 feet bgs) (Ref. 5, Appendix E, p. E-77) (see Table 5 of this HRS documentation record). In addition, sediment samples collected from Batchelor Creek contained concentrations of anthracene (up to 1,100 µg/kg), benzo(a)anthracene (8,000 µg/kg), chrysene (7,400 µg/kg), dibenzofuran (16,000 µg/kg), naphthalene (6,300 µg/kg), phenanthrene (up to 79,000 µg/kg) and pyrene (up to 36,000 µg/kg) (Ref. 5, Appendix E, p. E-137) (see Table 11 of this HRS documentation record).

In 2007, EPA SESD personnel advanced soil borings along the northern border of the property, between the stockpile, former lagoons, and Batchelor Creek, to evaluate whether pathways for free-phase creosote to enter Batchelor Creek exist and, if so, where they enter the creek (Ref. 18, pp. 4, 5). Visible and odorous impacts (believed to be organic contamination) to the soil were observed in several of the borings adjacent to and west of the stockpile. In addition, free-phase creosote was observed in at least one boring located adjacent to the stockpile (Ref. 18, pp. 6, 12). SESD concluded that the presence of free-phase creosote in the subsurface soil at the SWP facility indicated a potential for creosote to flow into Batchelor Creek (Ref. 18, p. 7).

EPA advanced boreholes in September 2008 throughout the SWP property and within the stockpile at depths ranging from 0 and 36 feet bgs. Borings advanced between the stockpile and Batchelor Creek, as well as west of the stockpile along Batchelor Creek, contained free product weeps. Free product was noted in 14 of the 29 boreholes (Ref. 47, p. 1, Enclosure 1, p. E1-1, Enclosure 2, pp. E2-1 through E2-29). Boring P3 contained free product weeps as deep as 33 to 36 feet bgs (Ref. 47, Enclosure 2, p. E2-20).

During the EPA RSE conducted in February 2008, creosote was observed in Batchelor Creek downstream from Source Nos. 1 and 2 (Ref. 19, p. 2; 19, Appendix C, p. 5). In September 2008, an ESI was conducted at the SWP property (Ref. 5, pp. 1, 7). During the ESI sampling event, creosote was observed in Batchelor Creek adjacent to and downstream from Source Nos. 1 and 2 (Ref. 5, Appendix D, pp. D-8, D-9). MDEQ personnel have observed creosote emanating from the SWP property into Batchelor Creek, as well as along the 15-mile surface water migration pathway TDL as far as the Big Black River, approximately 12.5 miles downstream of the SWP property (Ref. 7, pp. i, 2).

From August 2009 to November 2010, EPA conducted a time-critical removal action at the SWP property under CERCLA (Refs. 44, p. 1; 75, p. 1). Because of the creosote contamination in Batchelor Creek, EPA excavated between 1,500 and 1,800 linear feet of Batchelor Creek adjacent to the SWP property at depths ranging from 5 to 15 feet below the creek bed and stockpiled the creosote-contaminated sediment (approximately 45,000 to 50,000 tons) on the western portion of the property (Refs. 44, p. 1; 62; 70; 78) (see Figure 2 of this HRS documentation record). During excavation, free-phase creosote was observed in the creek bed and emanating from the creek bank adjacent to the SWP property (Refs. 7, p. 2; 44, p. 6;

62). On March 11, 2010, EPA collected six sediment samples (including 1 duplicate) from the creosote-contaminated sediment stockpile. SVOCs detected in these samples included anthracene (up to 5,600 µg/kg), benzo(a)anthracene (up to 3,200J µg/kg), benzo(a)pyrene (up to 1,200 µg/kg), benzo(k)fluoranthene (up to 1,200 µg/kg), chrysene (up to 2,800J µg/kg), dibenzo(a,h)anthracene (up to 170J µg/kg), dibenzofuran (up to 14,000J µg/kg), fluoranthene (up to 22,000 µg/kg), indeno(1,2,3-cd)pyrene (up to 440 µg/kg), naphthalene (up to 45,000 µg/kg), phenanthrene (up to 47,000 µg/kg), and pyrene (up to 12,000 µg/kg) (Refs. 74, pp. 15 through 31; 75, Appendix B, p. B-4). In addition to SVOCs, EPA analyzed the creosote-contaminated sediment stockpile samples for TCLP SVOCs and metals. No contaminants were detected at concentrations exceeding TCLP criteria; therefore, EPA classified the creosote-contaminated sediment stockpile as Non-RCRA hazardous waste and removed the pile to an off-site Class B waste management facility in Lake, MS (Refs. 44, pp. 34, 35; 70; 75, p. 6, Appendix B, p. B-6). The removal of the entire creosote-contaminated sediment stockpile was completed on September 24, 2010 (Ref. 75, p. 6). EPA also constructed a slurry wall measuring 1,500 feet long, three feet wide, and 30 feet below land surface between the SWP property and the southern bank of Batchelor Creek to prevent further migration of hazardous substances from the SWP property to Batchelor Creek (Refs. 70; 73, p. 6; 75, pp. 4, 5) (see Figure 2 of this HRS documentation record). Emplacement of the slurry wall did not, however, include the construction of any run-on control or runoff management features (Refs. 62; 75, p. 3)

Surface water flow at the SWP property is generally directed toward Batchelor Creek (Ref. 62). Prior to emplacement of the slurry wall, there were no containment measures in place to prevent hazardous substance migration from Source Nos. 1 and 2 from reaching Batchelor Creek, and free-phase creosote was observed in Batchelor Creek during the September 2008 EPA ESI (Refs. 25; 5, Appendix D, p. D-8). Analytical results for source samples collected from Source Nos. 1 and 2 in February and September 2008 contained site-related hazardous substances, including anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, dibenzofuran, indeno(1,2,3-cd)pyrene, naphthalene, pentachlorophenol, phenanthrene, pyrene, and dioxins and furans (see Tables 2 and 5 in Section 2.2.2 for Source Nos. 1 and 2 of this HRS documentation record). In addition, anthracene, naphthalene, phenanthrene, and pyrene have been documented as observed releases in sediment samples collected from Batchelor Creek (see Table 11 in Section 4.1.2.1.1, Observed Release, of this HRS documentation record). All of the observed release sediment samples were collected downstream of the area addressed by the EPA removal action in Batchelor Creek (Refs. 5, Appendix A, Figure 4, p. A-4; 19, Appendix A, Figure 2, p. A-2; 67, pp. 1, 2, 3) (See also Figure 2 of this HRS documentation record).

Other regulated facilities in the area include Canton Plating & Bumper Works, Inc. (CPBW) (EPA ID No. MSD008473282), Greif Industrial Packaging and Services, LLC (GIPS) (EPA ID No. MSD082008921), and Van Leer Containers (VLC) (EPA ID No. MSD082008921). All three facilities are located within 0.25 mile of the SWP property (Ref. 30, p. 9). A removal action was completed at the CPBW property in December 1984 (Ref. 71, p. 2). CPBW received a NFRAP (No Further Remedial Action Planned) designation in November 1990 and was archived in CERCLIS in July 2004 (Refs. 30, pp. 9, 14, 15; 71, p. 2). CPBW is located south-southwest of the SWP property and based on its location and intervening features, is not expected to contribute runoff to Batchelor Creek (Ref. 30, p. 9). GIPS is classified as a metal barrels, drums, kegs, and pails shipping facility in the EPA Facility Registry System (Ref. 76, p. 2). GIPS is also listed in RCRA as inactive and is classified as a RCRA large quantity generator of volatile organic compound (VOC) hazardous waste, including benzene, methyl ethyl ketone, tetrachloroethylene, trichloroethylene, toluene, and xylenes (Refs. 30, pp. 19, 21; 76, p. 1). GIPS received several notices of violation from the State in 1993 and 2001. In January 1996, a preliminary assessment was completed for the GIPS site at which point GIPS received a NFRAP designation. GIPS was archived in CERCLIS in December 1996 (Ref. 30, pp. 23 through 31). GIPS is located northwest of the SWP property and may potentially contribute runoff to Batchelor Creek. VOCs are not scored in this HRS documentation record as hazardous substances associated with Source Nos. 1 and 2 (see Section 2.2.2. for Source Nos. 1 and 2) or the observed release to Batchelor Creek (see Section 4.1.2.1.1 for Observed Release by Chemical Analysis) (Refs. 30, p. 18; 76, p. 1). VLC is classified as a metal barrels, drums, kegs, and pails shipping facility in the EPA Facility Registry System and is owned by Greif, Inc., the parent company of GIPS (Refs. 30, p. 20; 72, p. 1; 76, pp. 1, 6). VLC received SNFA (State No Further Action) status in February

1999. The major contaminant detected at the VLC property was arsenic (Ref. 30, p. 15). VLC is located northwest of the SWP property and may potentially contribute runoff to Batchelor Creek. Arsenic is not scored in this HRS documentation record as a hazardous substance associated with Source Nos. 1 and 2 (see Section 2.2.2 for Source Nos. 1 and 2) or the observed release to Batchelor Creek (see Section 4.1.2.1.1 for Observed Release by Chemical Analysis) (Ref. 30, p. 9). No other wood preserving facilities have been identified within a 4-mile radius of the SWP property (Ref. 30, pp. 5 through 9).

Canton Municipal Utilities operates a waste water treatment plant (WWTP) just south of SWP on North Hargon Street. Effluent from the WWTP flows through a pipe leading from the WWTP, underneath Covington Drive and the SWP property, and discharges into Batchelor Creek, just upstream from Source No. 1. A surface water sample collected from this effluent contained 2-Methylnaphthalene and benzo(a)pyrene at concentrations above the surface water background (Refs. 5, p. 17; 5, Appendix A, p. A-4, Appendix B, p. B-36). Neither of these substances was included in the observed release to Batchelor Creek documented by sediment samples.

Another possible source of contamination to Batchelor Creek is King Lumber. The current SWP property was originally part of a larger property owned by King Lumber, which operated the facility as a saw mill, lumber yard, and wood treating operation from 1928 to 1964 (Refs. 7; 8, pp. 1, 5; 69). King Lumber also owned the railroad that runs along the northern bank of Batchelor Creek, north of the SWP property. In addition, King Lumber constructed a mill pond north of the SWP property to store its lumber. This pond is currently being operated by CMU as a wastewater treatment pond (Ref. 69). Sediment samples SWP-SD-14 and SWP-SD-14-DUP collected from Tributary 3 downstream of the mill pond contained some SVOCs and were conservatively used as additional background sediment samples. However, sediment samples collected from Batchelor Creek downstream of Tributary 3 contained SWP source-related SVOCs at elevated concentrations (i.e., significantly above the background levels) (see Tables 9 and 11 of this HRS documentation record), indicating that these contaminants are at least partially attributable to SWP. Specific operations, waste management, and disposal procedures employed by King Lumber are not known.

The hazardous substances listed below have been documented in Source Nos. 1 and 2 as well as in Batchelor Creek, indicating migration of hazardous substances from the SWP sources (see Tables 2 and 5 in Section 2.2.2 for Source Nos. 1 and 2, and Table 11 in Section 4.1.2.1.1, Observed Release, of this HRS documentation record).

Hazardous Substances in the Release

Anthracene
Naphthalene
Phenanthrene
Pyrene

Surface Water Observed Release Factor Value: 550

4.1.2 DRINKING WATER THREAT

The drinking water threat was not scored because it is not expected to contribute significantly to the overall score.

4.1.3.2 HUMAN FOOD CHAIN THREAT WASTE CHARACTERISTICS

4.1.3.2.1 Toxicity/Persistence/Bioaccumulation

The toxicity, persistence, and bioaccumulation factor values for the hazardous substances detected in the sources with containment factor values of greater than 0 are summarized in Table 13. The combined toxicity, persistence, and bioaccumulation factor values are assigned in accordance with Reference 1, Section 4.1.3.2.1.

TABLE 13: Toxicity/Persistence/Bioaccumulation

Hazardous Substance	Source No.	Observed Release? (Yes/No)	Toxicity Factor Value	Persistence Factor Value[1]	Bioaccu-mulation Value[2]	Toxicity/ Persistence/ Bioaccumulation Factor Value (Table 4-16)	Reference
Anthracene	1, 2	Yes	10	0.4000	50,000	2 E+5	2, p. BI-1
Benzo(a)anthracene	1, 2	No	1,000	1	50,000	5 E+7	2, p. BI-2
Benzo(a)pyrene	1, 2	No	10,000	1	50,000	5 E+8	2, p. BI-2
Benzo(k) fluoranthene	1, 2	No	100	1	50,000	5 E+6	2, p. BI-2
Chrysene	1, 2	No	10	1	5.0	50	2, p. BI-3
Dibenzo(a,h) anthracene	2	No	10,000	1	50,000	5 E+8	2, p. BI-4
Dibenzofuran	2	No	1,000	1	500	5 E+5	2, p. BI-4
Indeno(1,2,3-cd) pyrene	2	No	1,000	1	50,000	5 E+7	2, p. BI-8
Naphthalene	1, 2	Yes	1,000	0.4000	50,000	2 E+7	2, p. BI-9
Pentachlorophenol	2	No	100	1	50,000	5 E+6	2, p. BI-9
Phenanthrene	1, 2	Yes	0	0.4000	5,000	0	2, p. BI-9
Pyrene	1, 2	Yes	100	1	50,000	5 E+6	2, p. BI-10
1,2,3,4,6,7,8-HpCDD	1, 2	No	10,000	1	50,000	5 E+8	2, p. BI-6
1,2,3,4,6,7,8-HpCDF	1, 2	No	10,000	1	50,000	5 E+8	2, p. BI-7
1,2,3,4,7,8-HxCDF	1, 2	No	10,000	1	50,000	5 E+8	2, p. BI-7
1,2,3,6,7,8-HxCDD	1, 2	No	10,000	1	5,000	5 E+7	2, p. BI-7

Notes:

[1] Persistence factor value for rivers
[2] Bioaccumulation factor value for fresh water
HpCDD Heptachlorodibenzodioxin
HpCDF Heptachlorodibenzofuran
HxCDD Hexachlorodibenzodioxin
HxCDF Hexachlorodibenzofuran

Toxicity/Persistence/Bioaccumulation Factor Value: 5 E+8
(Ref. 1, Section 4.1.3.2.1.4)

4.1.3.2.2 HAZARDOUS WASTE QUANTITY

TABLE 14: Hazardous Waste Quantity		
Source No.	**Source Type**	**Source Hazardous Waste Quantity**
1	Pile	6,119.2
2	Contaminated Soil	Undetermined, but greater than zero

The hazardous constituent quantity for Source No. 1 (stockpile of partially treated waste material) is not adequately determined.

It is not known whether contamination in Source No. 2 is continuous between sampling points (Ref. 5, Appendix B, Table 1, pp. B-1, B-2). Therefore, the area of Source No. 2 is undetermined, but greater than zero.

The sum of the Source HWQ values for Source Nos. 1 and 2 is 6,119.2, rounded to 6,119. Based on Reference 1, Table 2-6, the HWQ factor value is 100. Also, because Level II actual contamination is present in a fishery (Batchelor Creek), and hazardous constituent quantity is not adequately determined, the hazardous waste quantity receives a minimum factor value of 100 for the surface water migration pathway (Ref. 1, Section 2.4.2.2).

Sum of Source Hazardous Waste Quantity Values: 6,119.2 + >0 = 6,119
Hazardous Waste Quantity Factor Value: 100
(Ref. 1, Section 2.4.2.2)

4.1.3.2.3 CALCULATION OF HUMAN FOOD CHAIN THREAT WASTE CHARACTERISTICS FACTOR CATEGORY VALUE

The waste characteristics factor category was obtained by multiplying the toxicity/persistence and HWQ factor values, subject to a maximum product of 1×10^8. Then, this product was multiplied by the bioaccumulation potential factor value, subject to a maximum product of 1×10^{12}. Based on this product, a value was assigned in accordance with Reference 1, Table 2-7.

Toxicity/Persistence Factor Value: 10,000
Hazardous Waste Quantity Factor Value: 100

Toxicity/Persistence Factor Value ×
Hazardous Waste Quantity Factor Value: 1×10^6

Toxicity/Persistence Factor Value ×
Hazardous Waste Quantity Factor Value × Bioaccumulation Factor Value (50,000): 5×10^{10}

Waste Characteristics Factor Category Value: 320
(Ref. 1, Table 2-7)

4.1.3.3 HUMAN FOOD CHAIN THREAT TARGETS

As noted in Section 4.1.2.1.1, an observed release of hazardous substances having a bioaccumulation factor value of 500 or greater is documented in Batchelor Creek (see Tables 10 and 11 of this HRS documentation record). Fishing for consumption occurs on Batchelor Creek north of its intersection with Frey's Lane in Canton, Mississippi, in the vicinity of where sediment sample SWP-SD-11 was collected. Fish that are typically caught for consumption include brim, bass, and catfish. Bear Creek and the Big Black River are both fished regularly, and the fish are consumed (Refs. 4; 7, p. i; 37, pp. 1, 2). No fish advisories are currently in effect for Batchelor Creek, Bear Creek, and the Big Black River along the 15-mile surface water migration pathway TDL (Ref. 38).

Level I Concentrations

No Level I concentrations have been documented.

Level II Concentrations

Level II concentrations have been documented in the Batchelor Creek fishery at sample location SWP-SD-11 (see Table 11 of Section 4.1.2.1.1 of this HRS documentation record), collected downstream of the removal action (Refs. 5, Appendix A, Figure 4, p. A-4; 19, Appendix A, Figure 2, p. A-2; 67, pp. 1, 2, 3). As fishing is documented north of Frey's Lane, the zone of actual contamination in a fishery extends from Frey's Lane to SWP-SD-11.

Most Distant Level II Sample

Sample ID: SWP-SD-11
Distance from probable point of entry: 1.79 miles
References: 4; 5, Appendix A, Figure 4, p. A-4; 54; 77

TABLE 15: Level II Fishery

Identity of Fishery	Extent of Level II Fishery (Relative to PPE)	References
Batchelor Creek	From Frey's Lane to SWP-SD-11, 1.79 miles downstream of the western-most point of PPE 1	4; 5, Appendix A, Figure 4, p. A-4; 54; 77

4.1.3.3.1 Food Chain Individual

Level II Contamination Sample

Sample ID: SWP-SD-11
Level I/Level II/Potential: Level II
Hazardous Substances: Anthracene, naphthalene
Bioaccumulation Potential: 50,000
References: 2, pp. BI-1, BI-9; 5, Appendix A, Figure 4, p. A-4; 5, Appendix E, pp. E-169, E-170; 7, p. i; 37, pp. 1, 2

Level II concentrations have been found in Batchelor Creek within the TDL where a fishery has been documented to be present (Refs. 1, Section 4.1.3.3.1; 7, p. i; 37, pp. 1, 2; 54).

Food Chain Individual Factor Value: 45
(Ref. 1, Section 4.1.3.3.1)

4.1.3.3.2 Population

4.1.3.3.2.1 Level I Concentrations

No Level I concentrations have been documented.

4.1.3.3.2.2 Level II Concentrations

Fishing occurs on Batchelor Creek north of its intersection with Frey's Lane in Canton, Mississippi, approximately 1.79 miles downstream of PPE 1, near the location where sediment sample SWP-SD-11 was collected; and the fish are consumed (Refs. 7, p. i; 37, pp. 1, 2; 54; 77). The amount of fish caught on an annual basis is unknown but greater than zero because Batchelor Creek is a fishery (Refs. 7, p. i; 37, pp. 1, 2).

USGS flow rate data are not available for Batchelor Creek. Water level observations made during the EPA time-critical removal action since September 2009 indicate that the flow rate for Batchelor Creek is estimated to be from 0.13 to 22 cfs (Refs. 59; 60).

TABLE 16: Level II Population Threat

Identity of Fishery	Annual Production (pounds)	Human Food Chain Population Value (Ref. 1, Table 4-18)	References
Batchelor Creek	>0	0.03	5, Appendix A, Figure 4, p. A-4; 59; 60

Level II Concentrations Factor Value: 0.03
(Ref. 1, Section 4.1.3.3.2.2)

4.1.3.3.2.3 Potential Human Food Chain Contamination

TABLE 17: Potential Population Targets

Identity of Fishery	Annual Production (pounds)	Type of Surface Water Body	Average Annual Flow (cfs)	Population Value (P_i) (Ref. 1, Table 4-18)	Dilution Weight (D_i) (Ref. 1, Table 4-13)	$P_i \times D_i$	References
Batchelor Creek	>0	Small to Moderate Stream	10 to 100	0.03	0.1	0.003	5, Appendix A, Figure 4, p. A-4; 59; 60

Notes:
cfs Cubic feet per second

The portion of Batchelor Creek that is downstream of the documented actual contamination is being scored as a potentially contaminated fishery (Ref. 1, Section 4.1.3.3). For the potential human food chain contamination factor value the sum of $P_i \times D_i$ is divided by 10.

Potential Human Food Chain Factor Value: 0.0003
(Ref. 1, Section 4.1.3.3.2.3)

4.1.4 ENVIRONMENTAL THREAT

The environmental threat was not scored because it is not expected to contribute significantly to the overall score.